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INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the purchaser a complete apparatus equipped as hereinafter specified. With a view of obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful bidder must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who will be solely responsible for the design and construction of all features. The apparatus will conform to the requirements of the current (at the time of bid) National Fire Protection Association Pamphlet #1901 for Motor Fire Apparatus unless otherwise specified in these specifications.

Bids will only be considered from companies which have an established reputation in the field of fire apparatus construction and have been in business for a minimum of twenty (20) years.

Each bid will be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform. Computer run-off sheets are not acceptable as descriptive literature.

The specifications will indicate size, type, model and make of all component parts and equipment.

STATEMENT OF EXCEPTIONS TO NFPA 1901

If, at the time of delivery, the apparatus manufacturer is not in compliance, a statement of exceptions must be provided as follows:

- The specific standard affected.
- A statement describing why the manufacturer is not in compliance.
- A description of the remedy, and who the responsible party is.

The document must be signed by an officer of the company, and an authorized agent of the purchaser. **NO EXCEPTIONS**

QUALITY AND WORKMANSHIP

The design of the apparatus must embody the latest approved automotive engineering practices.

The workmanship must be the highest quality in its respective field. Special

consideration will be given to the following points: Accessibility to various areas requiring periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction must be rugged and ample safety factors must be provided to carry loads as specified and to meet both on and off road requirements and speed as set forth under "Performance Test and Requirements."

PERFORMANCE TESTS AND REQUIREMENTS

A road test will be documented with the apparatus fully loaded and a continuous run of ten (10) miles or more will be made under all driving conditions, during which time the apparatus will show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles will run quietly and free from abnormal vibration or noise throughout the operating range of the apparatus. The apparatus, when loaded, will be approximately 66% on the rear axle. The successful bidder will furnish a weight certification showing weight on the front and rear axle, and the total weight of the completed apparatus at the time of delivery.

a. The apparatus must be capable of accelerating to 30 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed engine RPM.

b. The service brakes will be capable of stopping the fully loaded vehicle within 35 feet from a speed of 25 MPH on a level concrete highway.

c. The apparatus, fully loaded, will be capable of obtaining a speed of 50 MPH on a level highway with the engine not exceeding 95% of its governed RPM (full load).

d. The apparatus will be tested and approved by a qualified testing agency in accordance with their standard practices for pumping engines.

e. The contractor will furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test (if applicable), the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

FAILURE TO MEET TESTS

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials will be final and conclusive and failure to comply with these requirements will be cause for rejection. Permission to keep and/or

store the apparatus in any building owned or occupied by the purchaser will not constitute acceptance of same.

EXCEPTIONS TO SPECIFICATIONS

The following specifications will be strictly adhered to. Exceptions will be considered if they are deemed equal to or superior to the specifications, provided they are fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS." Exceptions will be listed by page and paragraph.

Failure to denote exceptions in the above manner will result in immediate rejection of the proposal. In addition a general statement taking "TOTAL EXCEPTION" to the specifications will result in immediate rejection of bid.

GENERAL CONSTRUCTION

The apparatus will be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution will be in accordance with the recommendations of the International Association of Fire Chiefs and National Fire Association (or American Insurance Association). Certified Laboratories certificate will be submitted by the manufacturer. Weight of apparatus will meet all federal axle load laws.

DELIVERY REQUIREMENTS

The apparatus will be completely equipped as per these specifications upon arrival and on completion of the required tests will be ready for immediate service in the fire department of the purchaser. Any and all alterations required at the scene of delivery to comply with these specifications must be done at the contractor's expense.

PURCHASER RIGHTS

The Purchaser reserves the right to accept or reject any bid. The purchaser also reserves the right to award in their best interest and reserves the right to waive any formalities.

U.S.A. MANUFACTURER

The entire apparatus will be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protecting the purchaser should legal action ever be required.

MANUFACTURER'S EXPERIENCE

Each manufacturer will have been in business making similar apparatus for a minimum of fifty (50) years and must have had single ownership for more than fifty (50) years.

ELIMINATION OF DIVIDED RESPONSIBILITY

It is required that each bidder produce both the chassis and complete apparatus. To eliminate divided responsibility and service, the chassis and body must be manufactured by the same Company. Manufacturer will state the number of years the Company has been producing their own chassis and body. Manufacturer will state compliance with the paragraph. NO EXCEPTIONS.

FAMA COMPLIANCE

Manufacturer must be a current member of the Fire Apparatus Manufacturer's Association.

WIRING SCHEMATICS

One (1) CD and One (1) paper copy containing wiring diagrams of the apparatus will be provided at the time of delivery.

CHASSIS

The chassis will be manufactured in the factory of the bidder. The chassis will be designed and manufactured for heavy duty service with adequate strength and capacity of all components for the intended load to be sustained and the type of service required. There will be no divided responsibility in the production of the apparatus.

ALUMINUM CAB

The cab will be a full tilt 6-person cab with a 10" rear raised roof designed specifically for the fire service and manufactured by the chassis builder.

Cab will be built entirely by the apparatus manufacturer within the same facilities (no exceptions).

CAB DESIGN

The cab will be designed specifically for the fire service and manufactured by the chassis builder.

The apparatus chassis will be of an engine forward, fully enclosed tilt cab design. There will be four (4) side entry doors.

The cab will be of a fully open design with no divider wall or window separating the front and rear cab sections.

Construction of the cab will consist of high strength 5052H32 aluminum welded to extruded aluminum framing of 6061-T6 material.

The cab roof will utilize extruded, radiused outer corner rails with integral drip channel and box tubing type cross brace supports.

The cab sides will be constructed from extruded door pillars and posts that provide a finished door opening, extruded and formed wheel well openings supports, formed aluminum wheel well liners and box tubing type support braces.

The cab floor and rear cab wall will utilize box tubing type framing and support bracing.

The framework will be of a welded construction that fully unitizes the structural frame of the cab.

The structural extrusion framework will be overlaid with interlocked aluminum alloy sheet metal panels to form the exterior skin of the cab.

The structural extrusion framework will support and distribute the forces and stresses imposed by the chassis and cab loads and will not rely on the sheet metal skin for any structural integrity.

CAB SUB-FRAME

The cab will be mounted to a steel box tube sub-frame, and will be isolated from the chassis, through the use of no less than six (6) elastomeric bushings. The sub frame will be painted to match the primary chassis color.

The sub-frame will be mounted to the chassis through the use of lubricated Kaiser bushing for the front pivot point, and two (2) hydraulically activated cab latches, to secure the rear.

CAB TILT SYSTEM

An electrically powered hydraulic cab tilt system will be provided, and will lift the cab to an angle of 45 degrees, exposing the engine and accessories for service. The system will be interlocked to only operate when the parking brake is set.

The lift system will be comprised of two (2) hydraulic lift cylinders, an electrically driven hydraulic pump, and a control switch. A mechanical locking system will be provided to ensure the cab remains in the raised position in the event of a hydraulic failure. The cab tilt controls will be interlocked to the parking brake to ensure the cab will not move, unless the parking brake is set.

The hydraulic lift cylinders will be connected to a steel cab sub-frame, and not directly to the cab.

CAB DIMENSIONS

The cab will be designed to satisfy the following minimum width and length dimensions:

Cab Width (excluding mirrors)	98"
Cab Length (from C/L of front axle)	
To front of cab (excluding bumper)	68"
To rear of cab	62"
Total Cab Length (excluding bumper)	130"

FENDER CROWNS

Polished stainless steel front axle fenderettes with full depth radiused wheel well liners will be provided.

GRILLE

The front of the cab will be equipped with a stainless steel grille with sufficient area to allow proper airflow into the cooling system and engine compartment.

CAB INSULATION

The exterior walls, doors, and ceiling of the cab will be insulated from the heat and cold, and to further reduce noise levels inside the cab. The cab interior sound levels will not exceed 90 decibels at 45 mph in all cab seat positions. **NO EXCEPTIONS**

ROOF DESIGN

The cab will be of a one-half 10" raised roof design with side drip rails and will satisfy the following **minimum** height dimensions:

Cab Dimensions Interior
- Front 59"
- Rear 65"

Cab Dimensions Exterior
- Front 65"
- Rear 75"

EXTERIOR GLASS

The cab windshield will be of a two piece curved design utilizing tinted, laminated, automotive approved safety glass. The window will be held in place by an extruded rubber molding. The cab will be finished painted prior to the window installation.

SUN VISORS

The sun visors will be made of dark smoke colored transparent polycarbonate. There will be a visor located at both the driver and officer positions, recessed in a molded form for a flush finish.

CAB STEPS

The lower cab steps will be no more than 22" from the ground. An intermediate step will be provided, mid-way between the lower cab step, and the cab floor.

The intermediate step will be slightly inset to provide for safer ingress and egress. All steps will be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.

STEP LIGHTS

A white LED strip light will illuminate each interior cab step. These lights will illuminate whenever the battery switch is on and the cab door is opened.

CAB STRUCTURAL INTEGRITY

The cab of the apparatus will be designed and so attached to the vehicle as to eliminate, to the greatest possible extent, the risk of injury to the occupants in the event of an accident.

The apparatus cab will be tested to specific load and impact tests with regard to the protection of occupants of a commercial vehicle.

A test will be conducted to evaluate the frontal impact strength of the apparatus cab to conform to the test J2420 and the “United Nations Regulation 29, Annex 3, paragraph 4, (Test A). A second test will be conducted to evaluate the roof strength of the apparatus cab to conform to the Society Of Automotive Engineers (SAE) SAE J2422/SAE J2420 and “United Nations Regulation 29, Annex 3, paragraph 5, (Test B) and SAE J2420. The evaluation will consist of the requirements imposed by ECE Regulation 29, Paragraph 5.

The test will be conducted by a certified independent third party testing institution.

A letter stating successful completion of the above test on the brand of cab being supplied will be included in the bid. There will be **“no exception”** to this requirement.

SEAT BELT TESTING

The seat belt anchorage system will be tested to meet FMVSS 207 Section 4.2a and FMVSS 210 section 4.2. Testing will be conducted by an independent third party product evaluation company.

A copy of the certification letter will be supplied with the bid documents.

MANUAL CAB LIFT

There will be a manually operated hydraulic pump for tilting the cab in case the main pump should fail. Pump will be accessible, manufacturer to specify location.

CAB DOORS

The cab doorframes will be constructed from aluminum extrusions fitted with an aluminum sheet metal skin and will be equipped with dual weather seals. The outside cab door window opening will be framed by a black anodized aluminum trim, to provide a clean appearance. The cab doors will be equipped with heavy-duty door latching hardware, which complies with FMVSS 206. The door latch mechanism will utilize control cable linkage for positive operation. A rubber coated nylon web doorstop will be provided.

The doors will be lap type with a full-length stainless steel 3/8" diameter hinge and will be fully adjustable.

All openings in the cab will be grommeted or equipped with rubber boots to seal the cab from extraneous noise and moisture.

The cab doors will be designed to satisfy the following minimum opening and step area dimensions:

Door Opening:

Front	36.5" x 73"
Rear	36.5" x 73"

POWER WINDOWS

All four cab entry doors will have power windows. Each door will be individually operated and the driver's position will have master control over all windows. All four windows will roll down completely. NO EXCEPTIONS.

COMPUTER TRAY

There will be a slide-out tray in front of the officer's seat for a laptop computer or other use.

CENTER CONSOLE

There will be a center console mounted on the engine hood between the driver and

officer. The console will be covered in black vinyl material to match the engine hood. The console will come complete with two drink holders, and recessed wells for storage of gloves or other miscellaneous items.

The outboard sections will contain duct work to direct air flow from the heater/AC towards the driver and officer.

IN-CAB OVERHEAD STORAGE AREA

An overhead storage area will be provided at the front of the raised roof portion inside of the cab above the rear-facing crew seats. The full-width storage area will be approximately 84" wide x 10.5" high x 17" deep and will have a Zolatone gray/black rubberized, textured finish to match the cab interior. The storage area will be equipped with aluminum lift-up doors.

EMS CABINET, FORWARD FACING

There will be a cabinet constructed of .125 aluminum plate and painted to match the interior of the cab. The cabinet dimensions will be approximately 46" wide x 18" deep x 53" tall. The cabinet will come complete with a locking roll up door and three adjustable shelves. Strip lighting will be provided in the cabinet. The cabinet will be provided on the back wall of the cab, mounted on the crew seat riser, in place of the two forward facing crew seats. Cabinet will be pre-wired with 12 volt power.

INTERIOR DOOR PANELS

The interior of the cab entry doors will have a 304 brushed stainless steel scuff plate, contoured to the door, from the door sill down.

REFLECTIVE MATERIAL

The lower portion of the door panels will include a total of 245 square inches of reflective material on each door, exceeding the NFPA requirement of 96 square inches. The layout will be opposing ruby red “chevron” stripes on each side. The red striping will be laid over white 3M reflective materials. The reflective decal will be plainly visible to oncoming traffic when the doors are in the open position. Four (4) reflective Stop signs will be provided one (1) on each cab door.

CAB ACCESSORY FUSE PANEL

A fuse panel will be located underneath the rear facing seat on the officer's side. The fuse panel will consist of six (6) battery hot and six (6) ignition switch circuits. Each circuit will be capable of 10-ampere 12-volt power and total output of 50-amps. The fuse panel will be capable of powering accessories such as hand held spotlights, radio chargers, hand lantern chargers and other miscellaneous 12-volt electrical components.

GLOVE BOX HOLDER

There will be glove box storage in the upper portion of the crew cab doors.

AIR HORNS

Two (2) Grover 2040 Stuttertone rectangular, chrome plated, air horns will be recess mounted, one (1) each side behind the perforated grille of the bumper. The air horns will be controlled by a toggle switch wired through the horn button.

The air horns will be activated by a split "Y" lanyard in cab ceiling.

ALTERNATOR

A 320 ampere Prestolite/Leece Neville alternator with serpentine belt will be provided The alternator will generate 260 amperes at idle.

A low voltage alarm, audible and visual, will be provided.

FRONT AXLE

A Meritor™ MFS-20-133A non-driving, front steer axle with a capacity 20,000 pounds will be provided. The axle will have a 3.74" dropped I-beam, be 10 bolt hub piloted, and furnished with oil seals.

REAR AXLE

The rear axle will be a Meritor™ RS-26-160 Single reduction drive axle with a capacity of 27,000 lbs. The axles will be hub piloted, 10 studs, furnished with oil seals.

TOP SPEED

Rear axle speed approximately 65 MPH.

AUTOMATIC TIRE CHAIN SYSTEM

The apparatus will be equipped with an On-Spot brand Automatic Tire Chain System.

There will be one driver's side and one passenger's side chain unit.

A continuous duty solenoid will be provided and activated by the dashboard switch, which opens and allows compressed air to flow to the chain units. Compressed air will be delivered to the solenoid from the vehicle's air tank. The solenoid will be mounted on the frame rail or crossmember in close proximity of the chain units. This air/electric solenoid will be 12-volts and draw no more than 1 ampere of current. Electrical wire will be in accordance with NFPA 1901.

A 12-volt dashboard switch will be provided so that the operator may engage the chains from the driver's seat. The switch will be lighted to indicate when the chains are engaged. The switch will come complete with a switch guard to avoid accidental engagement of the automatic chains. The switch guard will be properly labeled. A dashboard sticker with operating instructions will be provided.

BATTERIES

The battery system will be a single system consisting of four negative ground, 12 volt Interstate Group 31 MHD batteries, cranking performance of 950 CCA each with total of 3800 amps, 185 minute reserve capacity with 25 ampere draw at 80 degrees Fahrenheit. Each battery will have 114 plates. Warranty will be accepted nationwide.

The batteries will be installed in a vented 304 stainless steel battery box with a removable aluminum cover to protect the batteries from road dirt and moisture. The battery cover will be secured with four “T” handle rubber hold downs to provide easy access for maintenance and inspection. Stainless steel hardware will be used for installation. The batteries are to be placed on dri-deck and secured with a fiberglass hold down. The batteries will be wired directly to starter motor and alternator.

The battery cables will be 3/0 gauge. Battery cable terminals will be soldering dipped, color-coded and labeled on heat shrink tubing with a color-coded rubber boot protecting the terminals from corrosion.

A 250-ampere fuse protecting the electric cab tilt pump will be supplied.

BATTERY CHARGING

A Kussmaul Auto Charge 1200 battery system charger will be provided. The Auto

Charge 1200 is a fully automatic battery charger with a very high output for vehicles with a single battery system. A single bar graph display is provided to indicate the state of charge of the battery system. The rated output will be 40 amps for the vehicle battery system.

A Kussmaul Model 091-55-20-120 super electric auto-eject with weatherproof cover and power interrupt will be provided.

BATTERY JUMPER TERMINAL

There will be one set (two studs) of battery jumper terminals accessible with the cab in the down position. The terminals will have plastic color-coded covers. Each terminal will be tagged to indicate positive/negative.

BRAKES (Front)

The front brakes will be Meritor S-cam style. They will be 16.5" x 6" with heavy-duty return springs, and a double anchor pin design. They will also have quick-change shoes for fast easy brake relining.

BRAKES (Rear)

The rear brakes will be Meritor S-cam style. They will be 16.5" x 7" with heavy-duty return springs, and a double anchor pin design. They will also have quick-change shoes for fast easy brake relining.

AIR BRAKE SYSTEM

The vehicle will be equipped with air-operated brakes. The system will meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1901 standards.

Each wheel will have a separate brake chamber. A dual treadle valve will split the braking power between the front and rear systems.

All main brake lines will be color-coded nylon type protected in high temperature rated split plastic loom. The brake hoses from frame to axle will have spring guards on both ends to prevent wear and crimping as they move with the suspension. All fittings for brake system plumbing will be brass.

A Meritor Wabco System Saver 1200 air dryer will be provided.

The air system will be provided with a rapid build-up feature, designed to meet current NFPA 1901 requirements. The system will be designed so the vehicle can be moved

within 60 seconds of startup. The quick build up system will provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time. The vehicle will not be required to have a separate on-board electrical air compressor or shoreline hookup to meet this requirement.

Four (4) supply tanks will be provided. One air reservoir will serve as a wet tank and a minimum of one tank will be supplied for each the front and rear axles. A Schrader fill valve will be mounted in the front of the driver's step well.

A spring actuated air release emergency/parking brake will be provided on the rear axle. One (1) parking brake control will be provided and located on the engine hood next to the transmission shifter within easy reach of the driver. The parking brake will automatically apply at 35 ±10 PSI reservoir pressure. A Meritor WABCO IR-2 Inversion Relay Valve, supplied by both the Primary and Secondary air systems, will be used to activate the parking brake and to provide parking brake modulation in the event of a primary air system failure.

Accessories plumbed from the air system will go through a pressure protection valve and to a manifold so that if accessories fail they will not interfere with the air brake system.

AIR BRAKING ABS SYSTEM

A Wabco ABS system will be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system will be fitted to axles and all electrical connections will be environmentally sealed from water and weather and be vibration resistant.

The system will constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which will sense approaching wheel lock and instantly modulate brake pressure up to 5 times per second to prevent wheel lock-up. Each wheel will be individually controlled. To improve field performance, the system will be equipped with a dual circuit design. The system circuits will be configured in a diagonal pattern. Should a malfunction occur, that circuit will revert to normal braking action. A warning light at the driver's instrument panel will indicate malfunction to the operator.

The system will consist of a sensor clip, sensor, electronic control unit and solenoid control valve. The sensor clip will hold the sensor in close proximity to the tooth wheel. An inductive sensor consisting of a permanent magnet with a round pole pin and coil will produce an alternating current with a frequency proportional to wheel speed. The unit will be sealed, corrosion-resistant and protected from electro-magnetic interference. The electronic control unit will monitor the speed of each wheel sensor

and a microcomputer will evaluate wheel slip in milliseconds.

ELECTRONIC STABILITY CONTROL SYSTEM

An Arvin Meritor / Wabco Electronic Stability Control (ESC) system will be provided and installed. The ESC system continually monitors the vertical acceleration, and yaw (horizontal plain rotation) of the vehicle, and compares it to a critical threshold where vehicle rollover may occur. When the critical threshold is met, the ESC will intervene by reducing engine torque and engaging the engine retarder, while automatically applying both the steering and drive axle brakes as needed. In many cases, activation occurs before the driver is even aware it is needed.

BUMPER

There will be a 12" high double rib polished stainless steel wrap-around bumper provided at the front of the apparatus. Laser cut perforated grilles will be incorporated into the bumper and located at the outboard section of the bumper for the air horns and at the center for the siren speaker. The bumper will be mounted to a reinforcement plate constructed of 1/4" x 10" x 70" carbon steel. A gravel shield will be provided, constructed of .188” aluminum diamond plate. The bumper extension will be approximately 18".

DIAMOND PLATE BUMPER LID

There will be a 1/8” diamond plate cover with latches provided for the front bumper trough. The cover will have a 2” rise to accommodate the storage well requirements.

STORAGE WELL COMPARTMENT

There will be a hose well compartment located in the center of the front bumper. The compartment will run the full width of the bumper and measure approximately 75" wide x 10" long x 5" deep at the ends and 12" deep in the center. The compartment will be constructed of .125" smooth aluminum plate.

COOLING SYSTEM

The cooling system will be designed to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system will be designed and tested to meet or exceed the engine and transmission manufacturer’s requirements, and EPA regulations.

The complete cooling system will be mounted in a manner to isolate the system from vibration and stress. The individual cores will be mounted in a manner to allow expansion and contraction at various rates without inducing stress to the adjoining

core(s).

The cooling system will be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components will include a surge tank, a charge air cooler, bolted to the top of the radiator to maximize cooling, recirculation shields, a shroud, a fan, and required tubing. All components will consist of an individually sealed system.

RADIATOR

The radiator will be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator will be bolted to the bottom of the charge air cooler to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

The radiator will be equipped with a drain cock to drain the coolant for serviceability. The drain cock will be located at the lowest point of the aluminum cooling system to maximize draining of the system.

CHARGE AIR COOLER

The charge air cooler will be of a cross-flow design and constructed completely of aluminum with extruded tanks. The charge air cooler will be bolted to the top of the radiator to allow a single depth core.

COOLANT

The cooling system will be filled with a 50/50 mix. The coolant makeup will contain ethylene glycol and de-ionized water to prevent the coolant from freezing to a temperature of –34 degrees F.

HOSES & CLAMPS

Silicone hoses will be provided for all engine coolant lines.

All radiator hose clamps will be spring loaded stainless steel constant torque hose clamps for all main hose connections to prevent leaks. Recirculation shields will be installed where required to prevent heated air from reentering the cooling package and affecting performance.

FAN

The engine cooling system will incorporate a heavy-duty composite 11- blade Z-series fan. It will provide the highest cooling efficiently while producing the lowest amount of

noise. This robust yet light-weight fan results in less wear and stress on motors and bearings.

A shroud and recirculation shield system will be used to ensure air that has passed through the radiator is not drawn through again.

The fan tip to radiator core clearance will be kept at a minimal distance to increase the efficiency of the fan and reduce fan blast noise.

FAN CLUTCH

A fan clutch will be provided that will allow the cooling fan to operate only when needed. The fan will remain continuously activated when the truck is placed in pump gear.

SURGE TANK

The cooling system will be equipped with an aluminum surge tank mounted to the officer's side of the cooling system core. The surge tank will house a low coolant probe and sight glass to monitor the coolant level. Low coolant will be alarmed with the check engine light. The surge tank will be equipped with a dual seal cap that meets the engine manufacturer's pressure requirements, and system design requirements.

The tank will allow for expansion and to remove entrained air from the system. There will also be an extended fill neck to prevent system overfill and encroachment of expansion air space. Baffling will be installed in the tank to prevent agitated coolant from being drawn into the engine cooling system.

DRIVE LINE

The driveline will consist of Spicer 1810 series dual grease fitting universal joints with "half-round" end yokes. The drive shaft will be built with a heavy-duty steel tube 4.095" outside diameter x .180 wall thickness. The shafts will be dynamically balanced prior to installation into the chassis. A splined slip joint will be provided in each shaft assembly. Universal joints will be extended life. There will be two (2) Zerk fittings in each universal joint assembly so the joint can be greased without turning the shaft.

ENGINE ENCLOSURE

An integral, formed aluminum and composite engine enclosure will be provided. The engine enclosure will be contoured and blended in an aesthetically pleasing manner with the interior dash and flooring of the cab. The enclosure will be kept as low as possible, to maximize space and increase crew comfort.

The enclosure will be constructed from 5052 H2 aluminum plate and GRP composite

materials, providing high strength, low weight, and superior heat and sound deadening qualities. The exterior sides will be covered with rubberized carpeting to aid in sound deadening and heat resistance. The top will be covered with a fiberglass grade cover, with a heavy duty, molded black vinyl, wear resistant covering, further reducing noise and heat in the cab.

The underside of the engine enclosure will be covered with a sound deadening, heat reflective insulation system, and will further minimize noise (DB levels), and eliminate engine heat from the front and rear of the cab. The insulation material will be bonded with adhesive and mechanically fastened to the underside of the cab. All seams will be sealed to prevent water absorption. NO EXCEPTIONS.

MOUNTING PLATES

A 3/16" aluminum plate will mounted on the engine cover and right rear interior wall of the cab for tool mounting.

ENGINE

The apparatus will be powered by a Cummins Diesel ISX 12 500 HP @ 1800 R.P.M., 1645 ft. lb. torque @ 1100 R.P.M.

ENGINE WARRANTY

The engine will have a five year or 100,000 mile warranty and approval by Cummins for installation in the chassis. There will be no deductible for the first two years. A one hundred dollar deductible will apply for service during the next three years.

AIR COMPRESSOR

The air compressor will be an 18.7 CFM engine driven Wabco.

STARTER

A 12-volt starter will be provided, controlled by a switch on the left lower cab dash.

FUEL FILTERS

The engine fuel filters will be mounted in a manner that is easily accessible for service or replacement. A Cummins approved primary FleetGuard Fuel Pro filter will be remote mounted to the Chassis frame rail. A secondary FleetGuard FF2200 spin on filter will be mounted on the engine.

EXHAUST SYSTEM

The engine exhaust system will include the following components:

- Diesel Particulate Filter (DPF)
- Diesel Oxidation Catalyst (DOC)
- Diesel Exhaust Fluid (DEF)
- Selective Catalytic Reduction Filter (SCR)

The SCR catalyst utilizes the DEF fluid, which consists of urea and purified water, to convert NOx into nitrogen and water. This will meet or exceed 2013 EPA emissions requirements.

The engine exhaust system will be horizontal design constructed from heavy-duty truck components. The exhaust tubing will be stainless steel to the DPF through to the SCR, aluminized steel from the SCR to the exhaust tip. A heavy duty stainless steel bellows tube will be used to isolate the exhaust system from the engine. The system will be equipped with single canister consisting of a Diesel Oxidation Catalyst (DOC) and a Diesel Particulate Filter (DPF), and will be mounted under the right side frame rail, meeting the specific engine manufacturer's specifications and current emission level requirements. The outlet will be directed to the forward side of the rear wheels, exiting the right side with a heavy duty heat diffuser. The heat diffuser will prevent the exhaust temperature from exceeding 851 deg. F during a regeneration cycle. A heat-absorbing sleeve will be provided on the exhaust pipe in the engine compartment area to reduce the heat, protect the alternator, and also to protect personnel while servicing the engine compartment.

AFTER TREATMENT SYSTEM

To meet EPA requirements of Particulate output, a DPF (Diesel Particulate Filter) is used. To meet EPA requirements of Nitrous Oxide output an SCR (Selective Catalytic Reduction) system utilizing DEF (Diesel Exhaust Fluid) is used.

ON-BOARD DIAGNOSTIC (OBD) SYSTEM

The engine will be equipped with an on-board diagnostic (OBD) system which will monitor emissions-related engine systems and components and alert the operator of any malfunctions. The OBD system is designed to further enhance the engine and operating system by providing early detection of emission-related faults. The engine control unit (ECU) will manage smart sensors located throughout the engine and after-treatment system. The system will monitor component verification and sensor operation. There will be warning lights located in the dash instrument panel to alert the operator of a malfunction. A data port will be provided under the driver’s side dash for the purpose of code reading and troubleshooting. All communication will be provided

through the J1939 data link.

AIR CLEANER/INTAKE

The engine air intake and filter will be designed in accordance with the engine manufacturer's recommendations. It will be 99.9% effective in removing airborne contaminants when tested per the industry standard SAE J726 procedure and offer a dirt holding capacity of at least 3.0 gm/cfm of fine dust (tested per SAE J726) offering superior engine protection.

The air filter will be located at the front of the apparatus and will be at least 66" above the ground, to allow fording deep water in an emergency situation.

An ember separator will be provided in the engine air intake meeting, the requirements of NFPA 1901.

An Air Restriction warning light will be provided and located on the cab dash.

ENGINE BRAKE

The engine will be equipped with a Jacobs compression engine brake. An "On/Off" switch and a control for "Low/High" will be provided on the instrument panel within easy reach of the driver.

The engine brake will interface with the Wabco ABS brake controller to prevent engine brake operations during adverse braking conditions.

A pump shift interlock circuit will be provided to prevent the engine brake from activating during pumping operations.

The brake light will activate when the engine brake is engaged.

DIESEL EXHAUST FLUID TANK

The exhaust system will include a molded cross linked polyethylene tank. The tank will have a capacity of 5 usable gallons and will be mounted on the left side of the chassis frame.

The DEF tank fill neck will accept only a 19mm dispensing nozzle versus the standard 22mm diesel fuel dispensing nozzle to prevent cross contamination. The DEF tank cap will be blue in color to further prevent cross contamination.

A placard will accompany fill location noting DEF specifications.

FRAME

The chassis frame will be of a ladder type design utilizing industry accepted engineering best practices. The frame will be specifically designed for fire apparatus use. Each frame rail will be constructed of two 3/8" thick-formed channels. The outer channel will be a minimun of 10" x 3.50” x .375” and the inner channel (liner) will be 9.31” x 3.13” x .375”. The section modulus will be 31.28 $in.^3$. The resistance to bending moment (RBM) will be 1,569,160 in./lbs. The cross-members will be constructed of minimum 3/8" formed channels and have formed gusseted ends at the frame rail attachment.

A bolt fastening system will be used on all permanently attached brackets to the frame to eliminate the need for bolt re-tightening or re-torquing.

A lifetime warranty will be provided, per manufacturer's written statement.

FUEL TANK

The chassis will be equipped with a 65-gallon stainless steel rectangular fuel tank. The fuel tank will be certified to meet FMVSS 393.67 tests. It will also maintain engine manufacturer's recommended expansion room of 5%.

The tank will be removable by means of six (6) bolted connections and dropped. One (1) tank baffle will be used.

Dual pick-up and return ports with a single 3/4" tank drawtube will be provided for diesel generators if required.

The fuel tank will be equipped with a 2 1/4" filler neck assembly with a 3/4" vent located on the left hand side of the tank. A fuel fill cap attached with a lanyard will be provided. The bottom of the fuel tank will contain a 1/2" drain plug.

The fuel lines will be nylon braid reinforced fuel hose with brass fittings. The lines will be carefully routed along the inside of the frame rails. All fuel lines are covered in high temperature rated split plastic loom. Single suction and return fuel lines will be provided.

The fuel tank will be mounted in a saddle with a barrier between the tank and the saddle.

There will be an access door provided to the top of the fuel tank.

FUEL COOLER

Installed on the apparatus fuel system will be an Air-To-Liquid aluminum fuel cooler. The fuel cooler will be located in the lowest module of the cooling system.

CAB HANDRAILS

There will be a 24" long, handrail provided and installed, at each cab entrance. The handrails will be constructed of type 304 stainless steel 1.25 inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges will be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail will have 90 degree returns to flanges. The ends of grab rail will pass through the flanges and be welded to form one structural unit. The handrails will be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange.

Sufficient space will allow for a gloved hand to firmly grip the rail.

There will be two (2) rubber coated grab handles provided and mounted on the interior of the cab, one each side, on the windshield post for ingress assistance. The handrail on the driver's side will be approximately 11" long and the handrail on the officer's side will be approximately 18" long.

CAB DOOR HANDRAILS

Two (2) 1.25" diameter knurled stainless steel handrails will be provided on the inside of the rear crew doors just above the windowsill.

HEAVY DUTY HEATER/DEFROSTER/AIR CONDITIONER

There will be a minimum 80,000 cool BTU and 75,000 heat BTU single unit, heater/air conditioner mounted over the engine cover. The unit will be mounted in center of the cab on the engine hood/enclosure. Unit will have a shutoff valve at the right side of the frame, next to the engine. Airflow of the heater/air conditioner will be a minimum 1200 CFM. To achieve maximum cooling, a TM-31 Compressor (19.1 cu. in.) will be used. There will be ductwork to the floor of the cab, facing forward to provide heat for the front of cab floor area.

The defroster/heater will be a minimum of 35,000 BTU and will be a separate unit mounted over the windshield. There will be eight (8) louvers/diffusers to direct to windshield and door glass. Airflow of the defroster/heater will be a minimum 350 CFM. The unit will be painted Zolatone greystone to match the cab ceiling.

The condenser will be roof mounted and have 80,000 BTU rating. The unit will include

two fan motors. Airflow of the condenser will be a minimum 2250 CFM. (This roof-mounted condenser will work at full rated capacity at an idle with no engine heat problems.)

HEATER/DEFROSTER/AIR CONDITIONING CONTROLS

The heater/defroster/air conditioning will be located in the overhead console in the center of the apparatus cab within reach of the driver and officer. The controls will be illuminated for easy locating in dark conditions. The controls will be located in such a way that the driver will not be forced to turn away from the road to make climate control adjustments. Control of all heater/defroster/air conditioning functions for the entire apparatus cab will be achieved through these controls.

DEFROSTER DIFFUSER

A molded diffuser made of durable ABS plastic ductwork system will be provided. It will be form fitted and will attach to the cab's overhead defroster unit to provide temperature controlled air to the windshields. Air flow of up to 280 cfm is balanced and directed across the entire windshield for optimum defrosting capability in all types of weather.

LOAD MANAGER

Load manager will have the ability to sequence loads on and off. It will also be able to shed 8 loads when the vehicle is stationary, starting at 12.7 volts lowest priority load to be shed, then respectively at 12.6, 12.4, 12.2, 12.0, 11.8, 11.4 and 11.0 volts DC. Any load that has been shed will be off for a minimum of five minutes, and then if voltage has rebounded above shed voltage, the shed load will automatically come on. There will also be an indicator panel along side the rocker switches, which indicate power is on, battery warning and fast idle. Battery warning indicator will flash at a rate proportional to the voltage discharge rate.

AUTOMATIC HIGH IDLE ACTIVATION

The load management system will be capable of activating the apparatus high idle system when the system voltage drops below 12.8 volts DC. The system will raise engine speed for a minimum of five minutes until voltage exceeds 13.0 volt DC. The load management system will activate the high idle feature before any devices are automatically shed OFF. The high idle function request from the load management device will function only if the appropriate interlocks are present; that is, control of the high idle system is monitored and will be superseded by the state of the interlock control module. The automatic high idle system will be deactivated whenever the brake pedal is pressed, and will remain inactive for two minutes thereafter to allow an operator to override the high idle function and return the engine to idle before PTO engagement.

INSTRUMENT PANEL

The main dash shroud, which covers the area directly in front of the driver from the doorpost to the engine hood, will be custom molded and covered with a non-glare black vinyl. The dash will be a one-piece hinged panel that tilts outward for easy access to service the internal components. The gauge panel will be constructed of durable aesthetically pleasing light gray polymer material, placed over a heavy duty steel backing plate, for added strength and durability.

The gauges will be Beede Instruments, NexSys Link gauges with built-in self-diagnostics and red warning lights to alert the driver of any problems. All gauges and controls will be backlit for night vision and identified for function. All main gauges and warning lights will be visible to the driver through the steering wheel.

MASTER BATTERY & IGNITION SWITCH

The vehicle will be equipped with a keyless ignition, with a three (3)-position Master Battery rocker switch, "Off/ACC/On" and a two (2)-position Engine Start rocker switch, "Off/Start".

DIESEL PARTICULATE FILTER CONTROLS

There will be two (2) controls for the diesel particulate filter. One control will be for regeneration and one control will be to inhibit engine regeneration. These will be located below the steering wheel in the kick panel.

INSTRUMENTATION & CONTROLS

Instrumentation on dash panel in front of the driver:

- Tachometer/hourmeter with high exhaust system regeneration temperature, and instrument malfunction indicators
- Speedometer/odometer with built in turn signal, high beam, and re-settable trip odometer
- Voltmeter
- Diesel fuel gauge
- DEF (Diesel Exhaust Fluid) gauge
- Engine oil pressure
- Transmission temperature
- Engine temperature
- Primary air pressure
- Secondary air pressure

Indicators and warning lights in front of the driver:

- Parking brake engaged

- Low air with buzzer
- Antilock brake warning
- Check transmission
- Transmission temperature
- Upper power indicator
- Seat belt
- Engine temperature
- Low oil indicator
- Low voltage indicator
- Air filter restriction light
- Low coolant indicator
- High idle indicator
- Power on indicator
- Check engine
- Stop engine
- Check engine MIL lamp
- DPF indicator
- High exhaust temperature
- Wait to start

Other indicator and warning lights (if applicable):

- Differential locked
- PTO (s) engaged
- Auto-slip response
- Retarder engaged
- Retarder temperature
- ESC indicator

Controls located on main dash panel in front of the driver:

- Master power disconnect with ignition switch
- Engine start switch
- Headlight switch
- Windshield wiper/washer switch
- Differential lock switch (if applicable)
- Dimmer switch for backlighting

Controls included in steering column:

- Horn button
- Turn signal switch
- Hi-beam low-beam switch
- 4-way flasher switch
- Tilt-telescopic steering wheel controls

CENTER CONTROL CONSOLE

There will be an ergonomically designed center control console. The console will be constructed of 1/8" smooth aluminum and will be mounted on the engine hood between the driver and officer. The console will have a durable coating to match the color of the engine hood covering and will feature surfaces on each side that are contoured to face the driver and the officer for easy viewing and accessibility. The switches and other customer specified electrical items will be mounted in removable 1/8" smooth aluminum panels with a black wrinkle finish. The console will have an aluminum lift-up lid with quick release latch. The lid will be held in the open position with a gas strut to allow for easy access and serviceability.

Controls located in the console conveniently accessible to the driver:

- Transmission shifter
- Pump shift control with OK TO PUMP and PUMP ENGAGED lights
- Remote mirror control
- Illuminated rocker switches to control high idle, Jacob's brake, siren/horn, siren brake, master emergency, and other customer specified components
- 12V power point (if applicable)

Controls located in the console conveniently accessible to the driver and the officer (center):

- Parking brake control with a guard to prevent accidental engagement

Controls located in the console conveniently accessible to the officer:

- Illuminated rocker switches to control customer specified components that are easily reachable to the officer and do not allow for compromise of the driver's view, and eliminate the need for foot switches
- Surface to recess siren head, radio head, or other desired items as space permits
- 12V power point (if applicable)

Driving compartment warning labels will include:

- HEIGHT OF VEHICLE
- OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION
- DO NOT USE AUXILIARY BRAKING SYSTEMS ON WET OR SLIPPERY ROADS
- EXIT WARNINGS

Additional labels included:

- COMPUTER CODE SWITCH
- ABS CODE SWITCH
- FLUID DATA TAG

- CHASSIS DATA TAG

OVERHEAD CONTROL CONSOLE

An ergonomically designed overhead console will be provided above the driver and officer, running the full width of the cab. The overhead console will be constructed from 1/8” aluminum plate and will be painted with a durable finish to match the inside of the cab. There will be seven (7) removable 1/8” smooth aluminum plates with a black wrinkle finish to house switches and other electrical items.

Directly above the driver there will be two (2) storage areas with nets.

There will be a panel located to the right of the driver that will be designated for defroster, heat, and air conditioning controls (if specified).

The center overhead panel will be designated for up to seven (7) door ajar indicators. Upon releasing the apparatus parking brake, one or more of these lights will automatically illuminate (flash) when any of the following conditions occur that may cause damage if the apparatus is moved: cab or compartment door is open; ladder or equipment rack is not stowed; stabilizer system deployed; any other device has not been properly stowed.

There will be a panel to the left of the officer as well as two (2) directly above the officer. These panels will have Radio equipment that will be provided by FD and installed per FD specs.

ENGINE WARNING SYSTEM

An engine warning system will be provided to monitor engine conditions such as low oil pressure, high engine temperature and low coolant level. Warning indication will include a STOP ENGINE (red) light with audible buzzer activation and a CHECK ENGINE (amber) light

Note: (Some engine configurations may also include a fluid warning light.)

There will be a master information light bar with 24 lights located across the center of the dash panel that covers up to 24 functions. These are defined under Indicators and Warning Lights above.

CHASSIS WIRING

All chassis wiring will have XL high temperature crosslink insulation. All wiring will be color-coded, and the function and number stamped at 3" intervals on each wire. All wiring will be covered with high temperature rated split loom for easy access to wires

when trouble shooting. All electrical connectors and main connectors throughout the chassis will be treated to prevent corrosion.

MASTER ELECTRICAL PANEL

The main chassis breaker panel will be wired through the master disconnect solenoid and controlled by the three-position ignition rocker switch. The breaker panel will be located in front of the officer on the interior firewall and will be protected by a removable aluminum cover. The cover will have an aluminum notebook holder on the exterior face accessible to the officer. The cover will be painted with a durable finish to match the interior of the cab and will be secured with two (2) thumb screws.

The breaker panel will include up to 22 ground switched relays with circuit breaker protection. An integrated electrical sub-panel will be provided and interfaced to the body and chassis through an engineered wire harness system.

Twelve (12) 20-ampere relays and one (1) 70-ampere relay will be provided for cab light bar and other electrical items. If the option for a mechanical siren has been selected two (2) additional relays will be provided.

Up to two (2) additional relay boards with circuit breaker protection will be provided for additional loads as required. Each board will contain four (4) relays. The relay boards will be configured to trip with input from switch of positive-negative or load manager by moving the connector on the board (no tools required).

All relay boards will be equipped with a power-on indicator light (red), input indicator light (green) and power output indicator light (red).

Up to twenty-three (23) additional automatic reset circuit breakers for non-switched loads that are remotely switched (ie: heater fans, hood lights, etc.) will be provided.

All relays and circuit breakers on the relay boards will be pull-out/push-in replaceable.

All circuit breakers on the relay boards will be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.

The system will utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

All internal wire end terminals, including locking connectors, will be mechanically affixed to the wire ends by matching terminal crimping presses to assure the highest quality terminations.

All internal splices will be ultrasonically welded connections and all internal wiring will be

high temperature GXL type wire that is protected by wiring duct wherever possible.

All switches will be ground controlled; no power going through any rocker switch.

Any switch controlling a relay in the breaker panel will be capable of being set to function only when the parking brake is set. All relays will be tagged with the function that the relay is controlling.

PUMP SHIFT MODULE

A pump shift module with indicating lights will be located within easy reach of the driver. A gear lockup will be provided to hold the transmission in direct drive for pump operation.

HIGH IDLE

The engine will have a "high idle" switch on the dash that will maintain an engine RPM of 1,000. The switch will be installed at the cab instrument panel for activation/deactivation. The "high idle" mode will become operational only when the parking brake is on and the truck transmission is in neutral.

AUXILIARY POWER POINTS

Three (3) 12-volt 20-ampere auxiliary lighter socket type plug-ins, will be provided in the cab, one near the driver and two near the officer.

VEHICLE DATA RECORDER

An Akron / Weldon vehicle data recorder as required by the 2009 edition of NFPA 1901 will be installed. Vehicle data will be sampled at the rate of 1 second per 48 hours, and 1 minute per 100 engine hours.

Software will be provided to allow the fire department to collect the data as needed.

INTERIOR

The cab interior will have Zolatone gray/black rubberized, mar resistant, textured finish. The full front and rear headliners and rear firewall will be finished in gray Durawear.

LIGHTING CAB EXTERIOR

Exterior lighting and reflectors will meet or exceed Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at this time.

XENON HID HEADLIGHTS

There will be dual Xenon High Intensity Discharge (HID) low beam rectangular headlights in custom housings on each side of the front of the cab. The high beams will be halogen.

Headlight alignment will conform to SAE J599 AUG. 1997
- DOT Approved FMVSS 108
- SAE J96 ECE Reg. 112
- Sealed to IP67

LIGHTING CAB INTERIOR

Interior lighting will be provided inside the front of the cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens. One light will be located over each the officer and driver's position. The lights will also activate from the open door switch located in each cab doorjamb.

LIGHTING CREW CAB INTERIOR

Interior lighting will be provided inside the crew cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens will be provided. The lights will also activate from the open door switch located in each cab doorjamb.

MIRRORS

Two (2) Lang Mekra 300 Series smooth chrome plated Aero style main and convex mirrors will be installed on each side of the vehicle. The main mirror will be 4-way remote adjustable 7" x 16" 2nd surface chromed flat glass. The convex will be 6" x 8" 2nd surface chromed 400 mm radius glass. Each mirror housing assembly will be constructed of lightweight textured chrome ABS with on truck glass and housing back cover replacement. In the event the mirror breaks the glass will be replaceable in (3) minutes or less. The glass will include a safety adhesive backing to keep broken glass in place. The mirror assembly will be supported by a "C" loop bracket constructed of polished stainless steel tube utilizing two point mounting reducing vibration of mirror glass during normal vehicle operation. The lower section of the holder will include a spring loaded single detent position 20 degrees forward with easy return to operating position without refocusing.

HELMET STORAGE

The helmets will be stowed in a compartment under the EMS Cabinet. A placard will be provided for each riding position warning that injury may occur if helmets are worn while

seated.

SEAT BELT WARNING SYSTEM

An Akron / Weldon seat belt warning system will be provided, and will monitor each seating position. Each seat will be supplied with a sensor that, in conjunction with the display module located on the dash, will determine when the seat belt was fastened and if the seat is occupied. An icon will represent that the seat is properly occupied. An audible and visual alarm will be activated if the seat is occupied and/or the belt is not fastened in the proper sequence.

DRIVER'S SEAT

The driver's seat will be a Bostrom Sierra FX air ride high back, adjustable fore/aft, upholstered with gray tweed Durawear. A 3-point seat belt will be provided.

OFFICER'S SEAT

The officer's seat will be a Bostrom Firefighter™ Tanker 450 ABTS SCBA seat. The seat will have the following features:

- Integrated 3-point seat belt
- "Auto-Pivot & Return" head rest
- Built in lumbar support
- 100% Durawear™ gray tweed seat material

UNDER SEAT STORAGE

There will be a storage compartment under the officer's seat approximately 15" wide x 10.5" tall x 15.5" deep.

CREW SEATS

The crew cab area will have two (2) Bostrom Firefighter™ seats. The seating arrangement will be: two (2) rear facing Bostrom Tanker 450 ABTS SCBA seats. The seats will have the following features:

- Integrated 3-point seat belts
- "Auto-Pivot & Return" head rest
- Built in lumbar support
- 100% Durawear™ gray tweed seat material

SCBA BOTTLE BRACKET

The officer and crew seats will come equipped with an H.O. Bostrom SecureAll™ SCBA Locking System capable securing all U.S. and international SCBA brands and sizes while in transit or for storage on fire trucks.

Locking will be achieved by pushing the SCBA unit (bottle) against the pivot arm to engage the automatic lock system. A top clamp will surround the top of the SCBA tank for a secure fit in all directions. The bracket will be equipped with a center guide fork to keep the tank in-place for a safe and comfortable fit in seat cavity.

All adjustment points will utilize one tool and be easily adjustable.

The bracket system will be free of straps and clamps that may interfere with auxiliary equipment on SCBA units.

The release handle will be integrated into the seat cushion for quick and easy release and will eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The bracket system will meet NFPA 1901 standards and requirements of EN 1846-2.

SCBA BOTTLE BRACKET

One (1) H.O. Bostrom SecureAll™ SCBA Locking System will be mounted on the back cab wall on the driver's side.

STEERING

The steering system will be a TRW wheel to wheel steering system that is tested and certified by TRW, consisting of a heavy duty TRW/Ross Model TAS-85 power steering gear, TRW PS36 steering pump, miter box, drag links, and a thermostatic controlled fan cooled system (set point 185 deg. F to 170 deg. F). The steering gear will be bolted to the frame at the cross-member for steering linkage rigidity. Four (4) turns from lock to lock with an 18" diameter slip resistant rubber covered steering wheel. Steering column will have six-position tilt and 2" telescopic adjustment. The cramp angle will be 45 degrees with 315mm tires or 43 degrees with 425mm tires providing very tight turning ability.

SUSPENSION (FRONT)

The front suspension will be a variable rate taper-leaf design, 54" long and 4" wide. Long life, maintenance free, urethane bushed spring shackles will be utilized. All spring and suspension mounting will be attached directly to frame with a high strength bolt

fastening system and self-locking round collars. Spring shackles and pins that require grease will not be acceptable. **NO EXCEPTIONS**.

ENHANCED FRONT SUSPENSION SYSTEM

The front suspension will have the handling, stability, and ride quality enhanced by the use of a Ride Tech auxiliary spring system and Koni high performance shock absorbers.

This system will utilize three stage, urethane auxiliary springs, and high performance gas filled shock absorbers to control the deflection of the leaf springs, and dampen vibration normally transmitted to the chassis. This maintenance free system will be custom tuned to the apparatus gross weight rating for maximum performance, while maintaining a soft compliant ride. **NO EXCEPTIONS.**

A (3) three year 36,000 mile warranty will be provided by the manufacturer.

SUSPENSION (REAR) 27,000 LB AIR RIDE

A Hendrickson FIREMAAX model FMX272 air ride rear suspension will be provided. The suspension will be a dual air spring design equipped with dual height control valves to maintain proper ride height. To reduce axle stress and maintain axle position and pinion angle the suspension design will incorporate three torque rods. The ground rating of the suspension will be 27,000 pounds.

TIRE PRESSURE MONITOR

A Real Wheels LED tire pressure sensor will be provided for each wheel. The pressure sensor will indicate if a particular tire is not properly inflated. A total of six (6) indicators will be provided.

FRONT TIRES

Front tires will be Goodyear 385/65R22.5, load range J, G296 highway tread, single tubeless type with a GAWR of 20,000 pounds. Wheels will be disc type, hub piloted, 22.5 x 12.25 10 stud 11.25 bolt circle. Chrome plated lug nut caps will be provided.

FRONT HUB COVERS

Polished stainless steel hub covers will be provided for the front axle.

REAR HUB COVERS

Polished stainless steel hub covers will be provided for the rear axle.

REAR TIRES

Rear tires will be Goodyear 12R22.5, load range H, G661 highway tread, dual tubeless type with a GAWR 27,000 pounds. Wheels will be disc type, hub piloted, 22.5 x 8.25 10 stud with 11.25" bolt circle. Chrome plated lug nut caps will be provided.

MUD FLAPS

Hard rubber mud flaps will be provided for front and rear tires.

WHEELS

The front and rear wheels will be ALCOA® brand aluminum. DURA-BRIGHT® finish will be provided on front and outside-rear wheels. Wheel separators will be provided between dual wheels.

TOW EYES (Front)

There will be two front tow eyes with 3” diameter holes attached directly to the chassis frame.

TOW EYES (Rear)

There will be two tow eyes attached directly to the chassis frame rail and will be chromate acid etched for superior corrosion resistance and painted to match the chassis.

TRANSMISSION

The chassis will be equipped with a Generation IV Allison EVS4000 six (6) speed automatic transmission. It will be programmed five (5) speed, sixth gear locked out, for fire apparatus vocation, in concert with the specified engine.

An electronic oil level indicator will be provided as well as a diagnostic reader port connection. The fifth gear will be an overdrive ratio, permitting the vehicle to reach its top speed at the engine's governed speed. The dipstick is dipped in a rubber coating for ease in checking oil level when hot.

The chassis to transmission wiring harness will utilize Metri-Pack 280 connectors with triple lip silicone seals and clip-type positive seal connections to protect electrical connections from contamination without the use of coatings.

Ratings:	Max Input (HP)	600
	Max Input (Torque)	1850 (lb ft)
	Max Turbine (Torque)	2600 (lb ft)

Mechanical Ratios:	1st -	3.51:1
	2nd -	1.91:1
	3rd -	1.43:1
	4th -	1.00:1
	5th -	0.74:1
	Reverse -	-5.00

TRANSMISSION COOLER

The apparatus transmission will be equipped with a Liquid-To-Liquid remote mounted cooler with aluminum internal components. The cooler will be encased in an aluminum housing and mounted to the outside of the officer's side frame rail for accessibility and ease of service.

TRANSMISSION FLUID

The transmission will come filled with Castrol TranSynd™ Synthetic Transmission Fluid or approved equal meeting the Allison TES-295 specification. **NO EXCEPTION.**

TRANSMISSION SHIFTER

An Allison "Touch Pad" shift selector will be mounted to the right of the driver on the engine cover accessible to the driver. The shift position indicator will be indirectly lit for nighttime operation.

FRONT TURN SIGNALS

There will be two Whelen 400 Series LED rectangular amber turn signal lights mounted one each side in the front of the headlight housing and one mounted on each side of the warning light housing.

WHEELBASE

The wheelbase will be approximately 190 inches.

WINDSHIELD WIPERS

Two (2) black anodized finish two speed synchronized electric windshield wiper system. Dual motors with positive parking. System includes large dual arm wipers with built in

washer system. One (1) master control works the wiper, washer and intermittent wipe features. Washer bottle is a remote fill with a 4 quart capacity. Washer fill is located just inside of officer cab door.

MISCELLANEOUS CHASSIS EQUIPMENT

Fluid capacity plate affixed below driver's seat.

Chassis filter part number plate affixed below driver's seat.

Maximum rated tire speed plaque near driver.

Tire pressure label near each wheel location.

Cab occupancy capacity label affixed next to transmission shifter.

Do not wear helmet while riding plaque for each seating position.

NFPA compliant seat belt and standing warning plates provided.

FIRE PUMP HALE QMAX-150

Fire pump will be midship mounted. The fire pump will be of the double suction single stage centrifugal type, carefully designed in accordance with good modern practice.

The pump will be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI.

The pump body will be horizontally split, on a single plane, casing type with removable lower casing for easy removal of the entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in the chassis.

All moving parts in contact with water will be of high quality bronze or stainless steel. Easily replaceable bronze labyrinth wear rings will be provided. Discharge passage will be designed to accomplish uniform pressure readings as the actual pump pressure. The rated capacity of the fire pump will be 1500 gallons per minute in accordance with NFPA# 1901.

The pump shaft will be rigidly supported by three bearings for a minimum deflection. One high lead bronze sleeve bearing will be located immediately adjacent to the impeller (on side opposite the drive unit). The sleeve bearing will be lubricated by a force fed, automatic lubrication system, pressure balanced to exclude foreign material. The remaining bearings will be heavy-duty type, deep groove ball bearings and will be

splash lubricated.

The pump shaft will have only one packing gland located on the inlet side of the pump. It will be of split design for ease of repacking. The packing gland must be a full circle threaded design to exert uniform pressure on the packing to prevent "cocking" and uneven packing load when it is tightened. It will be easily adjustable by hand with a rod or screwdriver and requiring no special tools or wrenches. The packing rings will be of a unique combination of braided graphite filament and braided synthetic packing and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

PUMP TRANSFER CASE

The drive unit will be designed of ample capacity for lubricating reserve and to maintain the proper operating temperature. Pump drive unit will be of sufficient size to withstand up to 16,000 lbs. ft. torque of the engine in both road and pump operating conditions.

The gearbox drive shafts will be heat treated chrome nickel steel. Input and output shafts will be at least 2-3/4" in diameter. They will withstand the full torque of the engine in both road and pump operating conditions.

The engagement of the pump transmission will be of such design so as to permit transfer of power from road to pump operation only after vehicle is completely stopped. The pump shift will be air actuated from the cab and have both a green "Pump Engaged" light, and a green "O.K.-To-Pump" light. A third green light will be provided on the pump operator's panel for "Throttle Ready".

The pump drive unit will be cast and completely manufactured and tested at the pump manufacturer's factory.

PRIMING SYSTEM

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multi-stage, venturi based AirPrime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control will activate the priming pump and open the priming valve to the pump. The priming system will have a five year warranty.

PUMP ANODE

A Hale pump anode kit assembly # 529-0050-00-0 will be provided and installed in the pump body. A minimum of two (2) anodes will be installed one (1) in the suction side and one (1) in the discharge side of the pump.

PUMP CERTIFICATION

The pump, when dry, will be capable of taking suction and discharging water in compliance with NFPA #1901 chapter 14. The pump will be tested by National Testing and will deliver the percentages of rated capacities at pressures indicated below:

100% of rated capacity @ 150 PSI net pump pressure.
70% of rated capacity @ 200 PSI net pump pressure.
50% of rated capacity @ 250 PSI net pump pressure.

THREAD TERMINATION

National Standard Thread will terminate the inlets and outlets of the apparatus.

PRESSURE GOVERNOR

Apparatus will be equipped with a Class1 Pressure Governor that is connected to the Electronic Control Module (ECM) mounted on the engine. The Governor will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's data for optimal resolution and response.

Programmable presets for RPM and Pressure settings will be easily configurable using the menu structure.

Engine RPM, system voltage, engine oil pressure and engine temperature with audible alarm output for all will be provided.

INTAKE RELIEF

There will be a Hale stainless steel intake relief valve installed on the intake side of the pump. The surplus water will be discharged away from the pump operator and terminate with Male NST hose thread. System is field adjustable.

AUXILIARY COOLER

An auxiliary cooler will be furnished to provide additional cooling to the engine under extreme pumping conditions. Water from the pump is to be piped to the coils of the heat exchanger allowing the engine fluid to be cooled as required.

VALVES

All valves will be Akron Heavy-Duty swing out 8800/8600 series unless otherwise noted. The valve will have an all cast brass body with flow optimizing stainless steel ball, and

dual polymer seats. The valve will be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve will not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve will be compatible with a slow close device. This valve will be actuated using manual handles, a Rack & Sector, manual gear, or electric actuator. The manual handles will be quickly adjustable to one of eight handle positions, and require only 90 degrees travel.

VALVE WARRANTY

The valves will carry a 10-year warranty.

PUMP CONNECTIONS

All suction and discharge lines (except pump manifolds) 1" and larger will be heavy-duty stainless steel pipe. Where vibration or chassis flexing may damage or loosen piping or where a coupling is necessary for servicing, a flexible connection will be furnished. All lines will be drained by a master drain valve or a separate drain provided at the connection. All individual drain lines for discharges will be extended with a 90 degree fitting in order to drain below the chassis frame. All water carrying gauge lines will utilize nylon tubing.

6” PUMP INLETS

Two 6" diameter suction ports with 6” NST male threads will be provided, one on each side of vehicle. The inlets will extend through the side pump panels and come complete with removable strainer and long handle chrome-plated cap.

2.5" RIGHT SIDE INLET

One 2.5" gated inlet valve will be provided on the right side pump panel. The valve will be supplied with chrome plate female swivel, plug, chain, and removable strainer.

The valve will attach directly to the suction side of the pump with the valve body behind the pump panel.

2.5" LEFT SIDE INLET

One 2.5" gated inlet valve will be provided on the left side pump panel. The valve will be supplied with chrome plate female swivel, plug, chain, and removable strainer. The valve will attach directly to the suction side of the pump with the valve body behind the pump panel.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with a 1/4 turn 3" full flow valve with check valve, with the remote control located at the operator's panel. The 3" tank to pump line will run from a bottom sump into the 3" valve. To prevent damage due to chassis flexing or vibration, a short 3" flexible rubber hose coupling will be used to connect the tank to the intake valve.

OUTLETS

The discharge valves will be an inline Tork-Lock constructed of brass and be of the quarter turn type of fixed pivot design to allow for ease of operation at all pressures. The valves will be controlled from the operator's panel and will be equipped with swing type locking handles. Each valve will be supplied with 2-1/2" National Standard Threads and come with chrome plated female caps and chains. 2-1/2" or larger discharge outlet will be supplied with a 3/4" quarter turn drain valve located at the outlet. All 2-1/2" and larger discharges will be supplied with a 30 degree angle down elbow.

2-1/2" LEFT SIDE DISCHARGES

Two (2) 2-1/2" gated discharges will be located on the left side pump panel. The valves will be of the quarter turn tork-lok ball type of fixed pivot design to allow for ease of operation at all pressures. The valve will be connected to the discharge side of the pump with the valve bodies behind the pump panel. A chrome swing type handle located on the pump operator's panel will control the side discharges.

2-1/2" RIGHT SIDE DISCHARGES

One (1) 2-1/2" gated discharge will be located on the right side pump panel. The valve will be of the quarter turn tork-lok ball type of fixed pivot design to allow for ease of operation at all pressures. The valve will be connected to the discharge side of the pump with the valve bodies behind the pump panel. A chrome swing type handle located on the pump operator's panel will control the right side discharges.

4" OUTLET

An Akron 4" electric valve will be provided on the right side pump panel. The valve will be controlled by an Akron 9313 controller at the pump operator's panel.

3" OUTLET LEFT REAR

There will be a 3" gated outlet piped to the left rear, adjacent to the hose bed. The outlet will be installed with proper clearance for spanner wrenches or adapters.

Plumbing will be 3" piping and a full flow 3" ball valve with the control at the pump operator's panel.

2.5" OUTLET LEFT HOSE BED

There will be a 2.5" gated outlet piped to the left front of the hose bed. The outlet will be installed with proper clearance for spanner wrenches or adapters. Plumbing will be 2.5" piping and a full flow 2.5" ball valve with the control at the pump operator's panel.

FRONT BUMPER DISCHARGE

A 1.5" discharge with 2" plumbing will be provided at the front bumper the hose connection will be made with the swivel inside the trough. The valve will be remote controlled at the pump panel.

DELUGE RISER

A 3" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced. The riser will be gated and controlled from the pump operators panel.

REMOTE CONTROL DECK GUN WITH REMOTE EXTEND-A-GUN

One (1) Extend-A-Gun RC 3 will be provided. The remote controlled telescoping waterway will be capable of being lowered to deck level (or into a monitor well) for monitor storage, and will be capable of raising the monitor to an extended position by electric remote control panel mounted on the pump panel. The extension travel length will be 18” and will lock and be usable in fully raised or fully lowered positions and operated by an electric motor controlled from TFT RC monitor controls or with optional remote control operators panel. Manual override will be included. The Extend-A-Gun RC 3 will allow for full 360° monitor rotation operation in either the raised or lowered positions. will have a 3” waterway, hard coat anodized finish, and built-in sensor for connection to “monitor raised” warning light. The Unit will have serial number and be covered by a 5-year warranty.

One (1) Monsoon® RC Monitor Series with remote controlled nozzle- Rated up to 1250 gpm, and 200 psi will be provided, the Monsoon RC is a remotely controlled fixed station or truck mounted monitor with electric remote control of rotation, elevation angle and nozzle pattern. The unit will have an electrically operated elevation control from 90° above and 45° below horizontal through a segmented waterway with minimal waterway turning angles and built-in stream shaping vane. The unit will have an electrically

operated 450° horizontal rotational travel, stainless steel worm gear, and user installed travel limit stops. User operation controls will be mounted on the monitor, and will include rotation, elevation, and nozzle stream pattern control programmable park and oscillate and two auxiliary controls. The monitor will be hardcoat anodized aluminum alloy and will have a silver powder coat finish inside and out. Unit will have serial number and be covered by a 5-year warranty.

SPEEDLAYS

Two (2) speedlays will be provided in the body next to the pump module, equipped with a roll out tray and accessible from both sides of the apparatus. The piping and valves will be 2", the swivel will be 1.5". The valves will be the "drop-out" style, push/pull controlled from the pump panel. Each compartment will hold 250 ft. of 1.75" double jacket hose.

SPEEDLAY

One (1) speedlay will be provided in the body next to the pump module each equipped with a lift-out tray and accessible from both sides of the apparatus. The piping and valve will be 2.5", the swivel will be 2.5". The valve will be the "drop-out" style, push/pull controlled from the pump panel. The compartment will hold 200 ft. of 2.5" double jacket hose.

CROSSLAY COVER

A vinyl cover will be provided to enclose the end of the crosslays, capable of being secured at the top and sides.

TANK FILL

A 2" tank fill line will be provided, using a quarter turn full flow ball valve controlled from the pump operator's panel.

FOAM TANK

There will be a 30-gallon foam tank. The tank will be part of the main booster tank. There will be a 3" PVC fill tower and cap and a tank vent. There will be a 1-1/2" flanged outlet and drain valve at the lowest point in the tank.

FOAM SYSTEM

The apparatus will be equipped with a FoamPro 2001 electric, fully automatic, variable speed, discharge side foam proportioning system. The system will be capable of handling class A and most types of class B foam. The system will be equipped with a 12-volt electric motor driven positive displacement foam concentrate pump, rated up to 2.6 gpm, with operating pressures up to 400 psi. and plumbed to all 1.5" discharges.

A digital computer control display will be provided and display will include the following functions:

- Push-button control of foam proportioning foam
- Current flow-per-minute of water
- Volume of water discharged
- Flow rate simulation
- Set-up and diagnostic functions
- "Low Concentrate" warning light
- "No Concentrate" warning light

PUMP AND GAUGE PANELS

The panels will be constructed of black vinyl covered aluminum for maximum protection against abrasion caused during normal use. The pump and gauge panels will be flush mounted on the aluminum extruded pump module framework.

Pump panels on both sides will be easily removable. The gauge and control panels will be two separate panels for ease of maintenance. The upper gauge panel will be hinged with a full-length stainless steel hinge held closed with a 1/4-turn latch. There will be one (1) hinged access door as large as possible located over the right side pump panel. This door will have a full-length stainless steel hinge and a 1/4 turn latching mechanism.

A pump panel layout drawing will be provided with the bid.

VALVE CONTROLS

The pump controls and gauges will be located at the left side of the apparatus and properly marked. The control panel will be laid out in a user-friendly manner.

All valve controls will have the corresponding discharge gauge located immediately adjacent to control handle to allow operator to view the discharge pressure without searching the panel.

ESCUTCHEON PLATES

The pump panel will be equipped with color-coded removable escutcheon plates around the suction and discharge valves.

COLOR CODING

Each discharge valve control, outlet, and corresponding line gauge will be color-coded. The color-coding will be determined at pre-construction to match current fire department apparatus.

EXTENDED PUMP MODULE

The pump module will be extended to provide room ahead of the pump panel to install the crosslay beds in a low position so they may be reached while standing on the ground.

PUMP MODULE FRAMEWORK & PUMP FINISH

The pump module framework and the fire pump will be painted to match the primary body color. All fittings, pipe ends and valve ends will be properly taped off prior to applying paint. The paint finish will be applied before the installation of any wiring, gauge lines, valve linkages, or operator's panel. The paint will be the same material used for the finished body and cab.

BACKBOARD STORAGE

There will be storage for two (2) backboards and one (1) stokes basket (all stored vertically on edge) in a compartment above crosslays with a hinged door.

PUMP PANEL LIGHTS, LED

The driver's side pump panel controls and gauges will be illuminated by a minimum of three (3) Weldon 2631 LED lights. The center pump panel light will activate when the apparatus is in pump gear.

PUMP PANEL GAUGES AND CONTROLS

The following gauges and controls will be provided at the pump panel:

- Two (2) certified laboratory test gauge outlets.
- Pump primer control.

- Master drain control and additional drains as needed.
- Tank-fill and pump cooler valve controls.
- Tank to pump valve control.
- Pump capacity rating plate.
- All discharge controls.
- Two (2) master pump gauges.
- Gauges on all 1-1/2" and larger discharge lines.

AIR OUTLET

Two (2) air chucks will be provided adjacent to the pump operator's panel, one on each side. The system will tie into the wet tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air. A 25 ft. air hose will be provided.

Note: Purchaser to specify type of hose fitting.

4" MASTER GAUGES

NoShok liquid filled pump pressure and vacuum gauges will be provided. The gauges will be 4" in diameter with white faces and black lettering. The gauges will have a pressure range of 30"-0-400 psi.

2.5" PRESSURE GAUGES

NoShok liquid filled individual line pressure gauges will be provided. The gauges will be 2.5" in diameter with white faces and black lettering. The gauges will have a pressure range of 0-400 psi.

WATER TANK GAUGE

An Innovative Controls weather proof encapsulated (14) super bright LED light indicator will monitor the water tank level and will be mounted on the pump operator's panel. The fourteen LED lights are arranged in a "V" pattern for easy identification of liquid level. When the liquid level reaches less than a 1/4 full the refill level begins to flash. The tank-sensing probe will be chemical resistant PVC with stainless steel sensing wires. The cover plate will be aluminum sub-plate, black background and blue graphics, with an outdoor exposure rated composite overlay.

WATER TANK GAUGE

Two (2) Whelen PSTANK LED strip lights will be provided on the cab side mounted near the rear doors. The lights will be steady burn green, blue, amber and flashing red to indicate water level in the booster tank.

FOAM TANK GAUGE

An Innovative Controls weather proof encapsulated (14) super bright LED light indicator will monitor the foam tank level and will be mounted on the pump operator's panel. The fourteen LED lights are arranged in a "V" pattern for easy identification of liquid level. When the liquid level reaches less than a 1/4 full the refill level begins to flash. The tank-sensing probe will be chemical resistant PVC with stainless steel sensing wires. The cover plate will be aluminum sub-plate, black background and red graphics, with an outdoor exposure rated composite overlay.

BODY SUB-FRAME

The body compartments will be attached to an aluminum sub-frame using a bolt fastening system that does not require tightening or re-torquing. . The sub-frame will be constructed from 6” x 2” x 5/16” structural channel, 3” x 1.5” x 3/16” tubing, and 1.5” x 3/16” angle. This sub-frame will rest directly on the chassis frame rails and will be separated from the chassis using 1/4” thick ultra-high-molecular-weight (UHMW) polyethylene pads at all contact points.

The bottom of the side body and rear body compartments will be supported from the chassis frame rails using a steel support system. At the front of the body there will be a minimum of two (2) steel support members constructed from 1/2” x 5” plate and 3/16” thick formed channel. These supports will be secured to the chassis using 5/8” grade-8 zinc-plated bolts. At the rear of the body there will be a heavy-duty steel rear platform constructed from 1/2" x 5” plate, 3/16” and 1/4" thick formed angles and channels, and 2” x 2” x 3/16” tubing. This rear platform will be attached to the chassis frame rails using 5/8” and 3/4” grade-8 zinc-plated bolts. The bottom of the side body and rear body compartments will be attached to the steel support system using a bolt fastening system that does not require tightening or re-torquing.

Self-supporting bodies will not be acceptable. NO EXCEPTIONS

APPARATUS BODY

The body will be constructed of 3/16" #5052 aluminum sheet, #3003 bright aluminum diamond plate and structural aluminum extrusions. The body will be of the modular design to allow for proper flexing of the truck chassis. The body will be custom built and engineered for proper load distribution on the chassis. An insulator material will be used where aluminum and steel are in contact to prevent corrosion.

The ceilings, sidewalls and floors of the body compartments will be constructed of 3/16”

5052-H32 smooth aluminum plate with a tensile strength range of 32,000 to 44,000 psi. Continuous 5356 fill welding will seal compartment panels.

The body framework will be constructed of custom-designed aluminum alloy 6063-T5 extrusions with a tensile strength of 35,000 psi.

To eliminate "dead space" and to maximize compartment interior space, there will be no more than 1/4" between outer and inner walls.

The compartment extrusions will be slotted full-length on backside for uniform fitting of the aluminum plate work that forms the compartment interiors.

The aluminum extrusion profiles will incorporate 1" x 1-3/4" recessed continuous door seal at the bottom of the compartment. The extrusions will be designed to allow unobstructed, sweep-out floors in all compartments.

The front, top, and rear surfaces of body will be covered with .125" bright aluminum diamond treadplate. The forward and rear recessed surfaces will be flush with the corner extrusions.

The compartment tops will extend downward over the extrusions and form a drip molding. The material will be .125 aluminum treadplate with approved aerated service for walking.

The compartment assemblies are to be fastened to the sub-frame with a bolt fastening system that does not require tightening or re-torquing.

The apparatus body will be a separate module form the pump enclosure and will not be fastened together in any manner.

Each compartment will be properly vented by louvers with a filter system to keep out dirt and road grime.

REAR STEP COMPARTMENTATION

A1- There will be a compartment provided at the rear step. The compartment will be approximately 40" wide x 40" high x 29-1/2" deep inside. The compartment will be provided with a roll-up door.

COMPARTMENTATION LEFT SIDE

L1- There will be a compartment, ahead of the rear wheels approximately 30-1/2" wide x 66" high x 27-1/4" deep inside.

L2- There will be a compartment above rear wheel approximately 61-1/2" wide x 36-1/2" high x 27-1/4" deep inside.

L3- There will be a compartment behind the rear wheels approximately 53-1/2" wide x 66" high x 27-1/4" deep.

COMPARTMENTATION RIGHT SIDE

R1- There will be a compartment ahead of the rear wheels approximately 30-1/2" wide x 60" high x 27-1/4" deep.

R2- There will be a compartment above rear wheels approximately 61-1/2" wide x 30-1/2" high x 27-1/4" deep.

R3- There will be a compartment behind the rear wheels approximately 53-1/2" wide x 60" high x 27-1/4" deep.

LED BODY LIGHTING

The apparatus will be equipped with LED strip lighting under the drip rail at the top of the body to illuminate when park brake is engauged.

COMPARTMENT DOORS

The compartment doors will be box pan construction. The outer door skin will be .190" 5052-H32 aluminum. The inner pan will be .125" 5052-H32 aluminum securely welded to the outer skin. A hat section channel will be installed in the center of the door to stabilize the door pan and to deaden the sound when closing the door. The doors will have double latches. Access cover plates will be provided to service latch mechanisms. The door edge will be 7/16" thick providing ample strength for the attachment of the door hinge. The door hinge will be polished stainless steel .075" thick with a 3/16" diameter pin and 1" long knuckles. The hinge will be attached using 1/4" truss head stainless steel bolts spaced 5" apart. The door will be of the double seal design incorporating an inner and outer "D" shaped extruded rubber automotive seal to provide a tight seal at each compartment.

Flush mounted chrome plated bent "D" ring door handles; single point positive type latches with adjustable catches (slam type door catches) will be provided on all compartments. Gas strut cylinder arms will be mounted on each swing out compartment door.

Compartments will have full-length stainless steel hinges. The compartment to the right of the pump panel will have a right hinged door, all other compartment doors will be left

hinged.

A door open indicator light will be provided in the cab.

ADJUSTABLE SHELF

There will be tweleve (12) adjustable shelves provided and installed in the compartments. The shelves will be fabricated of .188" aluminum plate. The exact location of the shelves will be determined at the pre-construction conference.

COMPARTMENT DIVIDER

There will be a vertical divider/partition provided in a compartment as specified. The divider will be constructed of .188" thick smooth aluminum plate. The top and bottom of the divider will have a formed flange bolted to the interior of the compartment.

ADJUSTABLE VERTICAL SLIDE-OUT PANEL

There will be an adjustable vertical slide-out tool board with a 250 lb. capacity supplied and mounted on unistrut tracks. Extra compartment lights will be provided and located as needed to properly illuminate the compartment.

TILT DOWN DRAWER

A Slide-Master pull out drawer with 30 degree tilt down feature will be provided and installed in a compartment. The drawer will have a distributed load capacity of 250 lbs. and be capable of extending 90% of it's depth. The tray will be fabricated of .188" aluminum plate and have a formed lip that measures 2".

600# SLIDE-MASTER TRAY

There will be a Slide-Master pullout drawer provided and installed. The drawer will have a distributed load capacity of 600 lbs. and be capable of extending 70% of its depth. The tray will be fabricated of .188" aluminum plate and have a formed lip that measures 2".

UNISTRUT

Each compartment will come equipped with 1.625" x .875" x .125" aluminum Unistrut channel. The Unistrut will be securely fastened to the interior walls of the compartment.

HOSE BED

The hose bed will be provided with aluminum slatted flooring radiused at the edges to prevent hose damage from sharp edges. Each hose bed floor section will be removable for easy access to the water tank.

HOSE BED DIVIDER

The hose bed will be divided by three (3) 3/16" aluminum partitions that are fully adjustable by sliding in tracks located at the front and rear of the hose bed. The dividers will be located as needed.

HOSE BED COVER

There will be a red nylon/vinyl hose bed cover for the main hose bed. The cover will be capable of being securely fastened at the front, sides and rear.

BODY HANDRAILS

Handrails will be constructed of type 304 stainless steel 1.25 inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges will be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail will have 90 degree returns to flanges. The ends of grab rail will pass through the flanges and be welded to form one structural unit. The handrails, will be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange. Sufficient space will allow for a gloved hand to firmly grip the rail. The rails will be located in the following areas:

(Note: These are in addition to those previously mentioned in the cab section):

There will be one (1) vertical handrail at rear of the body one each side of the rear compartment.

There will be two (2) handrails mounted horizontally, above the pump panel, one (1) on each side as large as possible.

STEPS

There will be fold-down steps mounted on each side of the front face of body to provide access to the top of the pump module and dunnage area.

The rear of the body will be equipped with fixed steps. The bottom step will measure 14" x 11" to provide a stable footing position. Each additional step above will measure 14" x 8" for clearance while climbing. Thinly fabricated aluminum steps will not be utilized.

The quantity and location of steps and handrails will meet the Current NFPA 1901 pamphlet in effect at the time the apparatus is ordered.

RUB RAILS

The body will be equipped with anodized aluminum channel style rub rails at the sides. Rub rails will be spaced away from the body by 1/2" polymer spacers. The rub rails will be polished to a bright finish.

ALUMINUM TREADPLATE

All load bearing aluminum treadplate running boards will be .155 thick bright-annealed finish. Running boards and rear step edges will be flanged down for added strength. Running boards will also be flanged up to form kick plates. All non-load bearing aluminum will be .125" thick bright annealed finish. In areas where aluminum treadplate will function as a load-bearing surface, there will be a heavy steel sub-structure. This structure will consist of 3" channel and 1-1/2" angle welded support. This will assure that there will be no flexing or cracking of running boards. The aluminum will be insulated from the steel by closed cell foam body barrier material.

Treadplate locations:

1. Skirting around front bumper.
2. The step at the cab entrance.
3. The jump seat steps.
4. The body header.
5. The running boards.
6. The rear step.
7. The top of the compartments.
8. The rear of the apparatus.
9. The rear fenders.

BOOSTER TANK

The tank will have a capacity of 750 U.S. gallons.

The tank will be constructed of 1/2" thick polypropylene sheet stock. This material will be a non-corrosive stress relieved copolymer thermo-plastic. The booster tank will be of a specific configuration and is so designed to be completely independent of the body and compartments. All joints and seams will be welded and/or formed and tested for maximum strength and integrity. The top of the booster tank is fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removability. The transverse swash partitions will be manufactured of 3/8" polypropylene and extend from

approximately 4" off the floor to just under the cover. The longitudinal swash partitions will be constructed of 3/8" polypropylene and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions will be equipped with vent and air holes to permit movement of air and water between compartments. The partitions will be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

The tank will have a combination vent and manual fill tower. The fill tower will be constructed of 1/2" polypropylene and will be a minimum dimension of 8" x 8" outer perimeter. The tower will be located in the left front corner of the tank. The tower will have 1/4" thick removable polypropylene screen and a polypropylene hinged-type cover. The cover tank will be constructed of 1/2" thick polypropylene to incorporate a multi three-piece locking design which allows for individual removal and inspection if necessary.

The sump will be constructed of 1/2" polypropylene and be located in the left front quarter of the tank. The sump will have a minimum of 3" national pipe threaded outlet on the bottom for a drain plug. This will be used as a combination clean-out and drain. All tanks will have a anti-swirl plate located approximately 2" above the sump.

All tank fill couplings will be backed with flow deflectors to break up the stream of water entering the tank.

The tank will rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor.

The tank will be completely removable without disturbing or dismantling the apparatus structure.

MASTER ELECTRICAL PANEL

The main breaker panel will be wired through the master disconnect solenoid and controlled with a three-position ignition rocker switch. Circuit breakers and flashers will be located at officer's right side lower interior firewall with removable cover and schematic provided with notebook holder on outside cover.

A deluxe breaker panel with up to 22 ground switched relays with circuit breaker protection will be provided.

An integrated electrical sub-panel will be provided and interfaced to the body and chassis through an engineered wire harness system.

Twelve (12) 20-ampere and one (1) 70-ampere relay for cab lightbar and assemblies will be provided. If the option for a mechanical siren has been selected two (2) additional relays will be provided.

Additional four relay boards with circuit breaker protection for additional loads. Maximum two boards (8 relays) per breaker panel. All relay boards set up to trip with input from switch of positive-negative or load manager by moving connector on board (no tools needed to do this).

All relay boards will be equipped with a power-on indicator light (red), input indicator light (green) and power output indicator light (red).

Up to 23 additional automatic reset circuit breakers for non-switched loads that are remotely switched (ie: heater fans, hood lights, etc.).

All relays and circuit breakers on the relay boards will be pull-out/push-in replaceable.

All circuit breakers on the relay boards will be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.

The system will utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

All internal wire end terminals, including locking connectors, will be mechanically affixed to the wire ends by matching terminal crimping presses to assure the highest quality terminations.

All internal splices will be ultrasonically welded connections and all internal wiring will be high temperature GXL type wire that is protected by wiring duct wherever possible.

All switches will be ground controlled; no power going through any rocker switch.

Any switch controlling a relay in the breaker panel will be capable of being set to function only when the parking brake is set. All relays will be tagged with the function that the relay is controlling.

BODY ELECTRIC SYSTEM

All body electrical wiring in the chassis will be XLP cross link-insulated type. Wiring is to be color-coded and include function codes every three (3) inches. Wiring harnesses will be routed in protective, heat resistant loom, securely and neatly installed. Two power distribution centers will be provided in central locations for greater accessibility. The power distribution centers contain automatic thermal self-resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and

transmission data links. All breakers and relays are utilized in circuits which amp loads are substantially lower than the respective component rating thus ensuring long component life. Power distribution centers will be composed of a system of interlocking plastic modules for ease in custom construction. The power distribution centers are function oriented. The first is to control major truck function and the second controls overhead switching and interior operations. Each module is single function coded and labeled to aid in troubleshooting. The centers also have accessory breakers and relays for future installations. All harnesses and power distribution centers will be electrically tested prior to installation to ensure the highest system reliability.

All external harness interfaces will be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points will be mounted in accessible locations. Complete chassis wiring schematics will be supplied with the apparatus.

The wiring harness contained on the chassis will be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. The wiring will be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring will be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

All harnesses will be covered with moisture resistant loom with a minimum rating of 300 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable has a minimum rating of 289 degree Fahrenheit.

All harnesses are securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations use a method that provides a positive mechanical and electrical connection and are in accordance to the device manufacturer's instructions. No connections within the harness utilize wire nut, insulation displacement, or insulation piercing.

All circuits conform to SAE1292. All circuits are provided with low voltage over current protective devices. These devices are readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers are not used for ground connections.

BACK-UP ALARM

An Ecco model SA917 automatic self-adjusting electronic back-up alarm producing 87-112 db will be installed at the rear between the frame rails. It will operate whenever the transmission’s reverse gear is selected.

COMPARTMENT LIGHTING

Each compartment will be equipped with two (2) LED light strips which will provide a consistent pattern to illuminate to entire compartment.

LICENSE PLATE BRACKET

A Cast Products LP0013 cast aluminum license plate bracket with LED light will be provided at the rear of the apparatus.

TAIL/STOP/TURN/BACKUP LIGHTS

The taillights are to be Whelen 600 LED style. The brake/tail lights to be red and exceed SAE requirements. The turn signal will be populated in an arrow pattern, amber in color. The backup lights will also be LED. One opening will be open to accept a 600 series warning light.

LED ICC/MARKER LIGHTS

LED type ICC/marker lights will be provided to meet D.O.T. requirements.

STEP LIGHTS

The pump module running board area will be illuminated by Whelen 2G 4” diameter LED lights mounted one each side on the front of the body in chrome flanges.

LED strip lighting will be provided at the front and rear of the body to illuminate all stepping surfaces.

GROUND LIGHTING

The apparatus will be equipped with lighting capable of illumination to meet NFPA requirements. Lighting will be provided at areas under the driver and crew riding area exits and will be automatically activated when the exit doors are opened. The ground lights will be Truck-lite® LED model #44042C. Lighting required in other areas such as work areas, steps and walkways will be activated when the parking brake is applied, provided the ICC lights are on.

WORK LIGHTS

There will be two (2) Unity brand AG 6" chrome plated sealed beam flood lights provided. The lights will be securely mounted at the upper rear of the apparatus body.

Each light will be supplied with individual switches.

OPTICAL WARNING SYSTEM

The optical warning system will be capable of two separate signaling modes during emergency operations. One mode will signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way and the other mode will signal that the apparatus is stopped and is blocking the right-of-way. Switching will be provided that senses the position of the parking brake.

A master optical warning device switch will be provided to energize all of the optical warning devices provided. All lights will operate at not less than the minimum flash rate per minute as specified by NFPA.

UPPER LEVEL WARNING DEVICES

The upper level is divided into zones A, B, C and D and the approved lighting package to be provided will be as follows:

Zone A (front) will have one (1) Whelen Freedom 72” Model FN72QLED NFPA 1901 compliant light bar, with twelve (12) LED modules. The light bar will have ten (10) red LED and two (2) clear LED heads and will be mounted on the cab roof.

Zone B (right side) will be covered by the module from the light bar and the right rear stanchion beacon.

Zone C (rear) will have two (2) Whelen Model MCFLED2R Micro Edge Freedom LED light bars, red, mounted on rear stanchions.

Zone D (left side) will be covered by the module from the light bar and the left rear stanchion beacon.

TRAFFIC ADVISOR

A Whelen LED TAL65 Traffic Advisor with a TACTRL1 Control Head will be provided and recessed above the rear roll up door. The low profile Traffic Advisor is approximately 1-1/2" high x 2-1/2" deep x 36" long. The six (6) LED lamp group is in a cap style extruded aluminum housing with black powder painted finish and surface mounted to eliminate large body panel cutouts. The high intensity LED's are rated for over 100,000 hours of operation and have extremely low current consumption. The Control Head has a four function rotary switch for selection of: center to left, center to right, center to left and right, or flash patterns. The dip switch on the rear panel selects the choice of eight (8) different programmable flash patterns. The Control Head features a visual LED status display.

LOWER LEVEL WARNING DEVICES

The lower level is divided into zones A, B, C and D and the approved lighting package to be provided will be as follows:

Zone A (front) will have a stainless steel warning light housing each side with two (2) Whelen 600 Super LED red lights mounted in the front of each housing. The inboard pair of lights is in addition to the minimum NFPA warning system and will be wired through a load-shedding device.

Zone B (right side) will have four (4) Whelen 600 Series Super LED red lights mounted one on the side of the headlight housing one on the cab below the window and between the cab doors and two on the body side at wheelwell of apparatus.

Zone C (rear) will have two (2) Whelen 600 Series Super LED, red lights mounted one each side of the rear of the apparatus.

Zone D (left side) will have four (4) Whelen 600 Series Super LED red lights mounted one on the side of the headlight housing one on the cab below the window and between the cab doors and two on the body side at wheelwell of apparatus.

FEDERAL Q2B SIREN

There will be a Federal Q2B-NN siren installed in the center of the cab grille. The siren will be securely mounted and activated by means of a solenoid and will include a brake.

A siren foot switch will be provided for both the driver and officer, one on each side of the cab floor.

SIREN

One (1) Federal Model PA-300MSC electronic siren will be installed at the cab instrument panel complete with noise canceling microphone. The horn button in the steering wheel, a switch on right hand side of cab floor and the control on the siren head will actuate the siren. A selector switch will be provided on the instrument panel for control of horn or siren by steering wheel button.

SIREN SPEAKER

Two Cast Products SA4201-5-A weatherproof siren speakers will be provided and mounted behind the perforated front bumper.

LED LIGHT WHELEN PIONEER

Two (2) Whelen Model PFP2 Pioneer Plus Dual Panel LED floodlights will be provided one each side of the cab. The lights will be housed in a heavy-duty aluminum housing.

Lumens:	10,000
Amps:	13
Volts:	12.8 DC
Bulb Type:	LED
Width:	14”
Height:	4-5/8”
Depth:	3”

The light will be mounted on a telescoping pole. A switch will be located at the light head.

GROUND LADDERS

The apparatus will be equipped with heavy duty, box type "I" beam rail, ground ladders. The ladders will meet the requirements of NFPA 1931 to ensure proper design and that sufficient strength is available for the service intended. The ground ladders will be constructed of aluminum with non-welded, field replaceable rung to rail connections to simplify field repairs and removable plated steel butt spurs for added strength. A full 1/2", non-rotting, poly rope will be provided for easy ladder operation.

One (1) Alco-Lite PEL-24 24 ft. two-section aluminum extension ladder.

One (1) Alco-Lite PRL-14 14 ft. aluminum roof ladder.

One (1) Alco-Lite FL-10’ 10 ft. folding ladder.

The ladders will have lifetime Warranty against manufacturing defects.

ZIAMATIC QUIC-LIFT LADDER RACK

The ground ladders will be mounted on a Ziamatic electric ladder rack system so that they may be automatically lowered to a convenient height for safe and easy removal. The rack will be made of high strength lightweight cast aluminum and be powered by two high cycle electric actuators and will be self-locking in any position. The rack will be capable of lowering the ladders approximately 31" from their stored position. Provisions will be made for Two (2) Pikepoles and One (1) 10ft folding ladder to be stowed on the bottom of the ladder rack.

CORROSION REDUCTION POLICY

The manufacturer will have in place a formal corrosion reduction program and assembly procedures designed for reducing and eliminating the possibility of corrosion. It is understood that fire apparatus will operate in harsh environments. At the time of the bid the apparatus manufacturer will show proof of a corrosion policy. Failure to submit this information could be grounds for rejection. If a formal policy is not in place explain in your bid how your firm will take the necessary steps for corrosion reduction. There will be no exception to this requirement.

In addition to a formal program the manufacture will show proof of testing corrosion reduction processes to ASTMB117. A copy of recent test will be included in the bid.

Frame Rails

The chassis frame rails will be coated with a high performance, two component, reinforced inorganic zinc rich primer with a proven cathodic protection makeup preferably Cathacoat 302HB. The surface will be clean and free of all salts, chalk and oils prior to application. Were the primer has been broken during the frame assembly process the area will be touch up to reestablish the seal. Prior to finish paint a second primer Devran 201 will be applied. Once the assembly of the frame is complete and the second primer is applied the entire assembly will be covered with high quality top coat paint preferably Imron 5000 or equal. The manufacturer will submit with the bid a copy of the product brochure and or description of the primer to be used.

Electro Plating

Steel and Iron brackets such as the pump module bracket will be Zinc plated to protect against corrosion. Plating will be in accordance with ASTM B663. The apparatus manufacturer will list all components with plating.

Fasteners

In any area that a stainless steel screw or bolt head is to come in contact with aluminum or steel, painted or non-painted, the fastener will have the underside if the head pre-coated with nylon. The nylon coating will act as a barrier between the fastener head and the metal or painted surface.

Screw or bolt taped into the metal will be pre-coated with a Threadlocker type material pre-applied on the threads.

When bolting together stainless steel the manufacturer will use a pan-head bolt with nylon coating under the head, a stainless washer with a rubber backing, and a Stover flange nut to secure the bolt.

When mounting aluminum components such as a step to the apparatus body. The manufacturer will use stainless washers with rubber backing. All mounted components will a barrier material between the two surfaces.

All rivet type fasteners will be of the same material being secured.

Whenever possible, pre-drill and tap all holes for mounting components such as lights, steps and hand rails prior to the paint process to reduce the corrosion opportunity. If a hole must be drilled into a previously painted surface, re-establish the paint barrier around the hole and use a flange-type nutsert with a gasket under the flange.

Where possible, minimize the number of stainless trim screws in aluminum. Structural tape and or adhesive will be used were possible for mounting trim to the body or cab.

If a pre-treated screw or bolt is not available, hand apply Dynatex Boltlocker or Theadlocker on the threads of the screw, bolt or nutsert. This will help seal threads from moisture and help prevent the fasteners from loosening.

If lubricant is used when tapping the hole, clean out the lubricant and the shavings before applying blue Threadlocker into the hole.

Barrier Tape
Barrier tape will be used on the backsides of all lights, trim pieces, or other components when bolting them to the apparatus; also when attaching stainless steel over an aluminum surface or when attaching aluminum treadplate to the stainless steel. All instances of dis-similar metals contacting each other require the addition of barrier tape between the metals where contact is made.

Before applying the tape, be sure the metal surface is clean from oil or dirt by cleaning the surface with a 50/50 mix of alcohol and water pr similar solvent.

Gaskets
Gaskets will be used under all snaps, loops and fasteners for such items as for hose bed covers. Reestablish paint seal around the mounting hole edges after drilling.

Mounting with Threadlocker coating will be used.

Flat washers with rubber backing will be used behind all lights that have stainless screws.

Rollup Doors
1 3/4" X 1/16” barrier tape will be used on the frame opening to act as barrier between the aluminum door rail and the painted door opening surface.

Use a paint stick around the holes after drilling and tapping. In mounting the rails, use screws with the nylon under the head and Threadlocker on the threads for mounting the doorframes.

Install barrier tape to the painted surface where the trim is located on top of the door opening.

Hinged Doors
Barrier tape will be applied to the painted surface of the body and on the painted hinge side of the door.

On the hinge side, mount tape out toward the edge to space over the barrel of the hinge, being sure to not touch the door.

Make sure the hinge fits into the extrusion frame with no corner weld beads interfering with the door fit. Do not put the hinge in a bind or cause the stainless steel hinge to touch the aluminum. Install the doors using a truss head bolt with the nylon coating under the head and Threadlocker on the threads.

Painting Steel
The manufacturer will wipe any oil residue dry, remove any rust and remove weld slag or smoke. Clean the surface with solvent before painting. Prime with one even coat of black Color primer, and then spray a topcoat over the primer for the finish coat. After bolts are tightened to the proper torque, touch up the bolt area and ends of the bolts with primer or cold galvanizing coating.

Mounting Emergency Lights and Options
All emergency lights, accessory mountings, Kussmaul covers, and 110 outlet boxes mounted to the body should be mounted with pre-coated Threadlocker and nylon under the head screws or bolts to minimize corrosion between dissimilar metals.

Electrical Grounding
Grounding straps will be installed consisting of a minimum 2-gauge strap bolted to the chassis frame.

A ground cable from the cab to the right side frame rail
From the alternator to the right side frame rail
From the pump module frame to the right side truck frame.
Aerials: from the hydraulic and pump module framework.
From the pump mount to the truck frame rail.
From the body module to the right side truck frame.

Proper grounding will help eliminate ground loop problems throughout the truck,

reducing the possibility for electrolysis and corrosion to occur. Provide clean connection points on all ground connections, (remove paint where applicable), and spray or brush on electrical sealer as necessary.

When installing foam system pump wiring the power must come from a dedicated breaker to a power solenoid, and then to the power terminal provided by FoamLogix or FoamPro. Pay particular attention to the grounding detail for wire size and good grounding practice, including removing the paint at the point of ground attachment to the chassis. Keep the length of ground wire as short as practically possible.

SALT SPRAY TESTING

Salt spray test will be used to confirm the relative resistance to corrosion of coated and uncoated metallic specimens, when exposed to a salt spray climate at an elevated temperature. Test specimens will be placed in an enclosed chamber and exposed to a continuous indirect spray of neutral (pH 6.5 to 7.2) salt water solution, which falls-out on to the specimens at a rate of 1.0 to 2.0 ml/80cm²/hour, in a chamber temperature of +35C. This climate will be maintained under constant steady state conditions.

Method

Salt fog testing will be performed by placing samples in a test cabinet that has been designed in accordance with Paragraph 4 (Apparatus) of ASTM B117 and operated in accordance with Paragraph 10 (Conditions) of ASTM B117.

A 5% salt solution, prepared by dissolving sodium chloride into water that meets the requirements of ASTM D1193 Specification for Reagent Water, Type IV is supplied to the chamber. At the time the samples are placed into test, the cabinet should be pre-conditioned to the operating temperature of 35ºC and fogging a 5% salt solution at the specified rate. The fog collection rate is determined by placing a minimum of two 80 sq. cm. funnels inserted into measuring cylinders graduated in ml. inside the chamber. One collection device will be located nearest the nozzle and one in the farthest corner.

Orientation

Unless otherwise agreed upon, the samples are placed at a 15-30 degree angle from vertical or tested in the “installed” position. This orientation allows the condensation to run down the specimens and minimizes condensation pooling. Overcrowding of samples within the cabinet should be avoided. An important aspect of the test is the utilization of a free-falling mist, which uniformly settles on the test samples. Samples should be placed in the chamber so that condensation does not drip from one to another.

Test durations

Test durations will be 500 hours except for sample rotation and daily monitoring of collection rates, the cabinet should remain closed for the duration of the test.

PAINTING

All exposed metal surfaces not chrome plated, polished stainless steel or bright aluminum tread plate will be thoroughly cleaned and prepared for painting. All irregularities in painted surfaces will be rubbed down and all seams will be caulked before the application of the finish coat.

All removable items such as brackets, compartment doors, door hinges, trim, etc. will be removed and painted separately to insure finish paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly. Both aluminum and steel surfaces to be painted will be primed with a two (2)-component primer which is compatible with the finish coat. The apparatus will be finish painted with a polyurethane base/clear system. “No Exception”

A barrier gasket/washer of "High Density Closed Cell Urethane Foam" will be used behind all lights, handrails, door hardware and any miscellaneous items such as stainless steel snaps, hooks, washers and acorn nuts. The gaskets/washers will be coated with pressure sensitive acrylic adhesive. All screws used to penetrate painted surfaces will be pre-treated/coated under the head with nylon and the threads will have pre-coat #80. This procedure will be strictly adhered to for corrosion prevention and damage to the finish painted surfaces.

The following paint process will be utilized:

Surface Preparation:

1. Wash surface thoroughly with mild detergent.
2. Clean and de-grease with Prep-Sol 3812S.
3. Sand and feather edge using 400 grit or finer on a dual action sander.
4. Remove sanding dust with a cleaner compatible with polyurethane base coat/clear coat final finish.

Substrate treatment:

1. Use a Metal Conditioner followed with a Conversion Coating product.

Priming:

1. Use a priming 615S pretreatment.
2. Use a self etching primer applied to achieve a 1.5 mil dft minimum.
3. Use Prime N Seal sealer compatible with polyurethane base coat.

Color Coat:

1. Apply polyurethane base coat 1-2 mil dft minimum.

Clear coat:

1. Apply polyurethane clear coat 2 mil dft minimum.

PAINT-TWO TONE CAB

The cab exterior surfaces will be two (2) colors. The paint break line will be at the bottom of the windshield.

PAINTED FRAME

The frame rails and body subframe will be painted the same color as the body.

LETTERING

Sixty (60) 3" 22KT Gold laminate goldleaf letters, with left hand shading and right hand outline to equal 3-5/8" letter, will be provided.

Customer supplied fire department emblems will be installed on the cab doors, one each side.

STRIPING

A 4" Scotchlite stripe will be provided across the front of the cab and along each side of the apparatus.

STRIPING, CHEVRON STYLE, REAR BODY

The apparatus will have 6” red and yellow reflective Chevron style striping affixed to the right and left portions of the rear body. The striping will be set in a manner to have the effect of an inverted “V” shape. The stripe will travel low to high from the outside to the inside.

MISCELLANEOUS EQUIPMENT FURNISHED

1 pt. touch-up paint per color.

A bag of stainless steel nuts and bolts, as used in the construction of the apparatus.

WHEEL CHOCKS

Two (2) Ziamatic #SAC-44 folding wheel chocks with SQCH-44H holders will be provided. The wheel chocks will be mounted immediately in front of rear wheel easily accessible from the side of the apparatus.

OPERATION AND SERVICE MANUALS

Complete "Operation and Service" manuals will be supplied with the completed apparatus, Two (2) printed copy and Two (2) CD. Service manual instructions will include service, maintenance and troubleshooting for major and minor components of the truck. The apparatus manufacturer will supply part numbers for major components (i.e. Engine, Axles, Transmission, Pump, etc.). A table of contents, hydraulic, air brake and overall apparatus wiring schematics will be included.

A video demonstration DVD on the operation of the truck will be supplied with the manuals.

WARRANTIES

The following warranties will be supplied:

1. The apparatus will be warranted to be free from mechanical defects in workmanship for a period of one (1) year. The apparatus will be covered for parts and labor costs associated with repairs for a period one (1) year.
2. Life-time warranty on the frame.
3. Seven (7) year warranty on paint.
4. Ten (10) body structural warranty
5. Ten (10) year cab structural warranty
6. Manufacturers Warranties for all major components.

Detailed warranty documents will be included for complete coverage on each of these warranties.

MANUFACTURING & LOCATIONS

The apparatus will be manufactured in facilities wholly owned and operated by the company. A complete stock of service parts, and service will be provided on a 24 hours around the clock basis. The company will maintain parts and service for a minimum period of twenty (20) years on each apparatus model manufactured.

OPTIONS

The following items will be priced as options:

INTAKE VALVE

A Hale Master Intake valve will be installed on the main pump inlet. It will be electrically actuated from the pump panel and include a manual override hand wheel on the pump panel. The valve will include a pressure relief valve to guard against incoming pressure surges.

4" MASTER GAUGES

Backlit liquid filled pump pressure and vacuum gauges will be provided. The gauges will be 4" in diameter with a pressure range of 30"-0-400 psi.

2.5" DISCHARGE GAUGES

Backlit liquid filled individual line pressure gauges will be provided. The gauges will be 2.5" in diameter with a pressure range of 0-400 psi.