REQUEST FOR PROPOSAL
CITY OF KENOSHA
KENOSHA FIRE DEPARTMENT
ONE (1) NEW AERIAL LADDER FIRE RESCUE UNIT
PROPOSAL NOTICE #04-23

ISSUED: THURSDAY , JUNE 01, 2023

Sealed proposals will be accepted by the City of Kenosha, in the Department of Finance, Municipal Office Building,625 52nd Street, Room, 208, Kenosha, WI. 53140 until Friday, June 30, 2023 at 03:30 P.M. for the provision and delivery of the following fire apparatus, all in accordance with City of Kenosha standards terms and conditions, and the specifications contained herein:

One (1) New Aerial Ladder Fire Rescue Unit

Proposals must be sealed and submitted on the attached form accompanying this proposal and returned clearly marked as to project description and number along with the scheduled date and time of the public opening. Proposals received after the date and time of opening will not be considered. All proposals shall be submitted in a sealed envelope carrying the following information: proposing firm's name, firm address, proposal description, proposal notice number and date and time of proposal opening. Proposals submitted via facsimile or through other electronic means will not be accepted.

Vendors shall furnish complete manufacturer specifications and manufacturers descriptive literature describing in detail the equipment that is proposed. Vendor shall answer all questions on the accompanying specification section. All inquiries in the specification section shall be answered completely. Any questions regarding these specifications should be directed to Mr. William Thomas, KFD Mechanic Supervisor at 262-925-5848. Inquiries regarding the proposal process and the submittal can be directed to the Finance Department at 262-653-4180.

The City of Kenosha reserves the right to award contract to the most qualified proposer. The City reserves the right to accept or reject any or all proposals or to accept any proposal that is considered the most advantageous to the City of Kenosha.

The City of Kenosha is exempt from from Federal Excise Tax and State Sales Tax, therefore, proposals should be made exclusive of these taxes. A Tax Exemption Certificate will be furnished to the successful vendor.

State delivery date on the proposal form or the number of days from receipt of a purchase order.

Delivery is F.O.B. Destination to the City of Kenosha, to the following address:

Kenosha Fire Department – Station 4
4810 60 Street
Kenosha, WI 53140.

Award will be made within thirty (30) days of scheduled opening to the lowest responsive and responsible vendor meeting or exceeding City of Kenosha Fire Department specifications, providing proposals are received within budgetary amounts.

Kenosha Fire Department
Aerial Apparatus Specifications List
2023

WIRING SCHEMATIC

Wiring diagrams of the apparatus shall be provided on a USB flash drive at the time of delivery.

TOP OF THE LINE CUSTOM CHASSIS

A Severe Duty Cab and Chassis system shall be provided. The chassis shall be manufactured in the factory of the bidder. The chassis shall 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. The cab and chassis system, shall be considered the bidders “Top of the Line”. There shall be no divided responsibility in the production of the apparatus.

WHEELBASE

The approximate wheelbase shall be 236.” The wheelbase shall not be longer than 240.”

DOUBLE FRAME RAILS/TANDEM AXLES

The chassis frame shall be of a ladder type design utilizing industry accepted engineering best practices. The frame shall be specifically designed for fire apparatus use.

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

FRONT TOW EYES, BELOW BUMPER

There shall be two front tow eyes with 3” diameter holes attached directly to the chassis frame, accessible below the front bumper.

REAR TOW EYES

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

STEERING

The steering system shall 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 shall 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 shall have six-position tilt and 2" telescopic adjustment. The cramp angle shall be 45 degrees with 315mm tires or 43 degrees with 425mm tires providing very tight turning ability.

- Or equivalent to the above listed option and/or meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

DRIVE LINE

A SPICER LIFE (SPL) Series Model 250 driveline shall be provided with a Meritor universal joint assembly. This configuration provides longer bearing life with the highest power density available. A high-capacity bearing package with larger needle rollers are sealed with a long life double-lip Viton seal and seal guard to keep grease in and allow a better purge capability. The high power density allows transmission of higher torque with a smaller swing diameter, assisting in tight packaging requirements (184mm swing diameter / 130mm tube diameter / 5mm wall). The 110 mm of slip is boot protected. On-highway lubrication intervals, initial at 350,000 miles or 3 years (whichever comes first) and re-lube at 100,000 miles thereafter.

- Or equivalent to the above listed option and/or meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

ENGINE

The apparatus shall be powered by a Cummins Diesel X 15 605 HP @ 1800 R.P.M., 1850 ft. lb. torque @ 1000 R.P.M.
Displacement: 14.9-liter displacement. Cylinders: 6

Bore: 5.39” (137mm)
Stroke: 6.65” (169mm)

- **NO EXCEPTIONS**

AIR COMPRESSOR

The air compressor shall be an 18.7 CFM engine driven.

STARTER

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

EXHAUST SYSTEM

The engine exhaust system shall be horizontal design constructed from heavy-duty truck components. The engine exhaust system shall include the following components:

STAINLESS STEEL TUBING

Stainless Steel Flexible Bellows mounted at the turbo outlet. Stainless steel piping to the After-treatment Unit. Stainless steel piping from the After-treatment Unit to the stainless steel heat diffuser outlet.

AFTERTREATMENT UNIT

The single canister After-treatment Unit is a self-contained exhaust treatment system which includes: DPF (diesel particulate filter)
DEF Injector/Reactor
SCR (selective catalytic reducer)

The DEF injector/reactor utilizes the DEF fluid, which consists of urea and purified water, to convert NOx into nitrogen and water. This will meet or exceed 2023 EPA emissions requirements.

The Stainless Steel Flexible Bellows shall be used to isolate the exhaust system from engine vibrations. The single canister After-treatment Unit shall be mounted under the right side frame rail, meeting the specific engine manufacturer's specifications and current emission level requirements. The heat diffuser outlet shall be directed to the forward side of the rear wheels, exiting the right side with a heavy duty heat diffuser. The heat diffuser shall prevent the exhaust temperature from exceeding 851 deg. F during a regeneration cycle.

INSULATED JACKETS

Heat-absorbing, removable, insulated jackets shall be provided on the exhaust system from the turbo outlet in the engine compartment to the After-treatment Unit. The jackets will cover all piping, including the bellows, between the engine and the After-treatment Unit per engine manufacturers requirements insuring that the exhaust stream temperature remains elevated to ensure functionality with the After-treatment Unit. Additionally, the insulated jackets will protect the engine components from excessive heat generated by the exhaust.

ON-BOARD DIAGNOSTIC (OBD) SYSTEM

The engine shall be equipped with an on-board diagnostic (OBD) system which shall 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 shall monitor component verification and sensor operation. There shall be warning lights located in the dash instrument panel to alert the operator of a malfunction. A data port shall be provided under the driver’s side dash for the purpose of code reading and troubleshooting. All communication shall be provided through the J1939 data link.

ENGINE WARRANTY

The engine shall have a five (5) year or 100,000 mile warranty and approval by Cummins Diesel for Full Engine Coverage Plan (RVF) – which is their most complete engine coverage plan, which includes EGR components installation in the chassis. There shall be no deductible for the first two years. A one hundred dollar deductible shall apply for service beginning the third year.

AFTERTREATMENT WARRANTY

The engine shall have a five (5) year or 100,000 mile After-treatment coverage warranty, which covers failures of the After-treatment Assembly which result, under normal use and service, from a defect in Cummins material or factory workmanship.

AIR CLEANER/INTAKE

The engine air intake and filter shall be designed in accordance with the engine manufacturer’s recommendations. It shall 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 shall be located at the front of the apparatus and shall be at least 24" above the ground, to allow fording deep water in an emergency situation.

An ember separator shall be provided in the engine air intake meeting, the requirements of NFPA 1900. An Air Restriction warning light shall be provided and located on the cab dash.

PRIMARY FUEL FILTER/WATER SEPARATOR

A Cummins approved Fleetguard style Fuel Pro FH230 fuel filter/water separator shall be remote mounted to the chassis frame rail.

12VDC HEATER

A 12V DC heater shall be provided for the Fleetguard style Fuel Pro FH230 fuel filter/water separator.

SECONDARY FUEL FILTER

A Cummins approved Fleetguard FF825NN style fuel filter will be mounted on the driver's side of the engine.

TRANSMISSION

The chassis shall be equipped with a Generation 5 Allison EVS4500 six (6) speed automatic transmission. It shall be programmed five (5) speed, sixth gear locked out, for fire apparatus vocation, in concert with the specified engine.

The transmission is communicated on the J-1939 through the communication port. The fifth gear shall 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 shall 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 – 4.70:1 2nd – 2.21:1
3rd - 1.53:1
4th - 1.00:1
5th - 0.76:1
Reverse - -5.55:1

- **NO EXCEPTIONS**

TRANSMISSION FLUID

The transmission shall come filled with an Allison approved Synthetic Transmission Fluid that meets the Allison TES-295 specification.

ENGINE BRAKE

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

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

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

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

TRANSMISSION COOLER

The apparatus transmission shall be equipped with a Liquid-To-Liquid remote mounted cooler with aluminum internal components. The cooler shall 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 SHIFTER

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

COOLING SYSTEM

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

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

The cooling system shall 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 shall 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 shall consist of an individually sealed system.
Integration of the Horton Revolution Fan, variable speed fan hub, Deep Core (200mm thick) radiator and charge air cooler, and a two-piece flexible membrane shroud will enable any manufacturer to meet the rigors of engine cooling while maintaining their current product line.

- Or equivalent to the above listed option and/or meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

RADIATOR

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall be bolted to the bottom of the charge air cooler to allow a single depth core (200mm), thus allowing a more efficient and serviceable cooling system.

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

CHARGE AIR COOLER

The charge air cooler shall be of a cross-flow design and constructed completely of aluminum with extruded tanks. The charge air cooler shall be bolted to the top of the radiator to allow a single depth core (200mm).

COOLANT

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

HOSES & CLAMPS

Silicone hoses shall be provided for all engine coolant lines.

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

FAN

The engine cooling system shall incorporate a heavy-duty Aluminum high efficiency hybrid flow centrifugal design fan, providing 20% greater air flow than axial type fans. Better under hood ventilation is achieved by the fan's configuration. Used in conjunction with an electronic/hydraulic variable speed hub, the system provides almost no operating noise. A floating two-piece shroud with flexible membrane and re-circulation shield system shall be used to ensure air that has passed through the radiator is not drawn through again.
The fan tip to radiator core clearance shall be kept at a minimal distance to increase the efficiency of the fan and reduce fan blast noise.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

FAN CLUTCH

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

SURGE TANK

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

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

FUEL TANK

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

There shall be two (2) tank baffles.

Dual pick-up and return ports shall be provided for diesel generators if required.

The fuel lines shall be nylon braid reinforced fuel hose with brass fittings. The lines shall 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 shall be provided.

The bottom of the fuel tank shall contain a 1/2" drain plug.

FUEL FILL

The fuel tank shall be equipped with a 2-1/4" filler neck assembly with a 3/4" vent located on the driver's side of the truck. A fuel fill cap attached with a lanyard shall be provided.

FUEL COOLER

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

DIESEL EXHAUST FLUID TANK

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

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

A placard shall accompany fill location noting DEF specifications.

ALTERNATOR

A 415-ampere alternator shall be provided. The alternator shall be serpentine belt driven. The alternator shall generate 220-amperes at idle.

LOW VOLTAGE ALARM

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

BATTERIES

The battery system shall be a single system consisting of six (6) negative ground, 12-volt Worldwide WB-31S- PL Group 31 batteries, cranking performance of 950 CCA each with total of 5700 amps, 195 minute reserve capacity with 25 ampere draw at 80 degrees Fahrenheit. Each battery shall have 114 plates. The batteries shall include a two-year warranty.

The batteries shall 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 shall 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 shall be wired directly to starter motor and alternator.

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

There shall be a 350-ampere fuse protecting the pump primer and a 250-ampere fuse protecting the electric cab tilt pump and other options as required.

BATTERY JUMPER TERMINAL

There shall be one set (two studs) of battery jumper terminals located by the battery box under the cab. The terminals shall have plastic color-coded covers. Each terminal shall be tagged to indicate positive/negative.

BATTERY CHARGER

A Kussmaul Auto Charge Chief 4012 model #091-266-12-40 40-amp battery charger shall be provided and installed in the cab. The unit shall include a built-in touch screen, IP32 rated, and configurable for 3-step or float charging. The charger shall be wired to the 120V shoreline inlet.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

120V SHORELINE INLET & AUTO EJECT

The apparatus shall be equipped with a 120V shoreline inlet to provide power to the battery charger from an external source. The inlet shall include a Kussmaul 091-55-266-XX Super 20 Auto Eject featuring a built in OLED display on the cover. Also featuring a 12-volt solenoid which shall eject the shoreline cord away from vehicle path upon sensing engine start. After ejection, a weatherproof cover shall snap into position over inlet.

A 20-amp connector shall be provided and shipped loose for connecting the external shoreline cord to the inlet.

FRONT AXLE

A Hendrickson STEERTEK NXT non-driving, front steer axle with a capacity of 24,000 pound shall be provided. The axle shall have a 3.74" drop and will have a fabricated boxed shaped cross section, a one-piece knuckle, and serviceable king pin. Adjustable Ackerman settings shall be available, and determine based on wheelbase. The axle shall have 10 bolt hubs piloted, and furnished with oil seals.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

SUSPENSION (FRONT)

The front suspension shall be a parabolic taper-leaf spring design, 56" long and 4" wide. Long life, maintenance free, threaded pin bushings in spring shackles shall be utilized. All spring and suspension mounting shall be attached directly to frame with high strength Huck bolts and self-locking round collars. Progressive rate bump stop and custom tuned passive hydraulic damper shall be supplied.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

STEER ASSIST

The steer assist provides driver assistance when turning the vehicle left or right while traveling.

REAR AXLE

The rear axle shall be a Meritor™ RT-48-160 Tandem drive axle with a capacity of 48,000 lbs. The axles shall be hub piloted, 10 studs, furnished with oil seals.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

INTER-AXLE DIFFERENTIAL LOCK

A locking inter-axle differential shall be provided between the two rear axles. An activation switch shall be provided on the driver's dash.

SUSPENSION (REAR)

The rear suspension shall be a Link Manufacturing, Air Link™ model 952-40-899 air ride suspension. This suspension shall incorporate a quad air spring system. The air suspension bags shall have internal rubber stops giving the ability to operate without air if the need arises. Heavy-duty shock absorbers shall be provided, inboard mounted, to dampen load forces, reduce tire hops, and improve stopping. Torque rods shall be incorporated to restrict lateral movement of the differentials and to reduce bushing and tire wear. Dual height control valves shall be provided to maintain even, balanced loads. Suspension shall have a ground rating of 48,000 pounds (48,000 LBS TANDEM AIR RIDE).

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

REAR TIRES

Rear tires shall be Goodyear 12R22.5, load range H, mud and snow tread, dual tubeless type with a GAWR up to 52,000 pounds. Wheels shall be disc type, hub piloted, 22.5 x 8.25 10 stud with 11.25" bolt circle.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

TIRE PRESSURE MONITOR

A wireless tire pressure monitoring system shall be installed. A digital display will be installed over the driver's head.

WHEELS

The front and rear wheels shall be ACCURIDE® brand aluminum.

- Or equivalent meeting current minimum NFPA Fire Apparatus requirements and/or current DOT Regulations.

HUB COVERS

Polished stainless steel hub covers shall be provided for the front and rear axle.

LUG NUT CAPS

Chrome plated lug nut caps shall be provided for the front and rear wheels.

FRONT MUD FLAPS

Hard rubber mud flaps shall be provided for front tires.

REAR MUD FLAPS

Hard rubber mud flaps shall be provided for the rear tires.

BRAKES (FRONT)

The front brakes shall be Arvin Meritor DiscPlus EX225 Air Disc Brakes. Each disc brake assembly shall include one (1) 17" vented rotor, one (1) lightweight hub, one (1) twin-piston caliper, and two (2) quick-change pads.

- **NO EXCEPTIONS**

BRAKES (REAR)

The rear brakes shall be Arvin Meritor DiscPlus EX225 Air Disc Brakes. Each disc brake assembly shall include one (1) 17" vented rotor, one (1) lightweight hub, one (1) twin-piston caliper, and two (2) quick-change pads.

- **NO EXCEPTIONS**

AIR BRAKE SYSTEM

The vehicle shall be equipped with air-operated brakes. The system shall meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1900 standards.

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

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

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

The air system shall be provided with a rapid build-up feature, designed to meet current NFPA 1900 requirements. The system shall be designed so the vehicle can be moved within 60 seconds of startup. The quick build up system shall 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 shall not be required to have a separate on-board electrical air compressor or shoreline hookup to meet this requirement.

Six (6) supply tanks shall be provided. One air reservoir shall serve as a wet tank and a minimum of one tank shall be supplied for each the front and rear axles. A Schrader fill valve shall be mounted in the front of the driver's step well.

A spring actuated air release emergency/parking brake shall be provided on the rear axle. One (1) parking brake control shall be provided and located on the engine hood next to the transmission shifter within easy reach of the driver. The parking brake shall 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, shall 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 shall go through a pressure protection valve and to a manifold so that if accessories fail they shall not interfere with the air brake system.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

AIR OUTLET

One (1) air chuck shall be provided on the cab as specified. The system shall 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.
Note: Purchaser to specify type of hose fitting.

AIR INLET

An air system inlet/fill connection shall be provided. The inlet shall be connected to the air brake to allow constant air feed. The location of the inlet shall be on the left hand side of the driver's step well.

AUTO-EJECT

An auto-eject with female coupling shall be provided.

AIR BRAKING ABS SYSTEM

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

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

The system shall consist of a sensor clip, sensor, electronic control unit and solenoid control valve. The sensor clip shall 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 shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion-resistant and protected from electro-magnetic interference. The electronic control unit shall monitor the speed of each wheel sensor and a microcomputer shall evaluate wheel slip in milliseconds.

COMPRESSION FITTINGS ON AIR SYSTEM

All airline fittings installed on the chassis shall be compression style fittings. The following locations shall utilize push-on fittings:

- Pressure protection valve (accessory block)
- Double check valve (braking system, park brake)
- One way check valve (brake valve tank)
- Elbow Male Modified 1/4" tube x 1/4" MP (low air switch)
- Elbow Male 1/4" tube x 3/8"MP (brake pedal solenoid)
- Connector 1/4" x 3/8"MPT (brake pedal solenoid)
- Switch stoplight (Wabco sealed switch/brake light and service brake switch)
- Low pressure switch (PTC) (Wabco sealed switch/low air switch)
    - **NO EXCEPTIONS**

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.

CAB

The cab shall be a full tilt 6-person 10" rear raised roof (preferred) cab designed specifically for the fire service and manufactured by the chassis builder. The outside of the rear cab wall shall be aluminum diamond plate.

Note: Apparatus cabs that are not manufactured by the apparatus manufacturer shall not be acceptable.

CAB DESIGN

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

The cab shall be of a fully open design with no divider wall or window separating the front and rear cab sections. The cab shall be designed in a manner that allows for the optimum forward facing vision for crew. Cab designs that utilize roof mounted air conditioning units, are not desired.

The cab shall be constructed of high strength 5052H32 aluminum plate welded to 6061-T6 extruded aluminum framing. Cab mounting should include a sub-frame.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

CAB DIMENSIONS

The cab shall 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) 70" To rear of cab 62"
Total Cab Length (excluding bumper) 132"

FENDER CROWNS

Black rubber front axle fenderettes with full depth radiused wheel well liners shall be provided.

CAB INSULATION

The exterior walls, doors, and ceiling of the cab shall be insulated from the heat and cold, and to further reduce noise levels inside the cab. The cab interior sound levels shall not exceed 80 decibels at 45 mph in all cab seat positions.

EXTERIOR GLASS

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

SUN VISORS

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

CAB STRUCTURAL INTEGRITY

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

A test shall 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 shall 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 shall consist of the requirements imposed by ECE Regulation 29, Paragraph 5.

The test shall 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 shall be included in the bid. There shall be “no exception” to this requirement.

SEAT BELT TESTING

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

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

CAB LOCK-DOWN LATCHES

Cab lock-down latches shall be provided to prevent the cab from being tilted in the down position. Once the cab tilt switch is engaged the cab latches will release to allow the cab to be tilted.

CAB TILT SYSTEM

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

MANUAL CAB LIFT

There shall be a manually operated hydraulic pump for tilting the cab in case the main pump should fail. Access to the pump shall be located under the left corner of the front bumper.

CAB DOORS

The cab doorframes shall be constructed from 6061 T6 aluminum extrusions fitted with a 5052 H32 aluminum sheet metal skin and shall be equipped with dual weather seals. The outside cab door window opening shall be framed by a black anodized aluminum trim, to provide a clean appearance. The cab doors shall be equipped with heavy-duty door latching hardware, which complies with FMVSS 206. The door latch mechanism shall utilize control cable linkage for positive operation. A rubber coated nylon web doorstop shall be provided.

The doors shall be lap type with a 10-gauge full-length stainless steel flange and 3/8" diameter hinge pin and shall be fully adjustable.

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

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

CAB STEPS

The lower cab steps shall be no more than 22" from the ground. Grip strut material shall be installed on the stepping surface.

An intermediate step shall be provided, mid way between the lower cab step, and the cab floor. The intermediate step shall be slightly inset to provide for safer ingress and egress. Diamond plate material shall be installed on the stepping surface.

All steps shall be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.

AUXILIARY CAB STEPS

There shall be one additional step under each cab door to assist with entrance and exit of the cab. The steps shall be constructed of aluminum with a grip strut stepping surface.

STEP LIGHTS

A white TecNiq E45 style LED strip light shall illuminate each interior cab step. These lights shall illuminate whenever the battery switch is on and the cab door is opened.

POWER WINDOWS

All four cab entry doors shall have power windows. Each door shall be individually operated and the driver's position shall have master control over all windows. All four windows shall roll down completely.

WINDSHIELD WIPERS

Two (2) black anodized finish two speed 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.

WINDSHIELD WASHER RESERVOIR

A windshield washer reservoir shall be provided.

MIRRORS

Two Aero style main and convex mirrors shall be installed on each side of the vehicle. The main mirror shall be 4-way remote adjustable with heat. In the event the mirror breaks the glass shall be replaceable in (3) minutes or less.

The glass shall include a safety adhesive backing to keep broken glass in place. The mirror assembly shall 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 shall include a spring loaded single detent position 20 degrees forward with easy return to operating position without refocusing.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

UPPER GRILLE

The front of the cab shall be equipped with a raised grille with sufficient area cut out to allow proper airflow into the cooling system and engine compartment.
Note: Plastic chrome plated grilles shall not be acceptable.

LOWER GRILLE

The front of the cab shall be equipped with a lower grille. The design shall allow proper airflow into the cooling system and engine compartment.
Note: Plastic chrome plated lower grille shall not be acceptable.

BUMPER

There shall be a 12" high double rib polished stainless-steel wrap-around bumper provided at the front of the apparatus. Laser cut perforated grilles shall 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. A gravel shield shall be provided. The bumper extension shall be approximately 12".

BUMPER SIDES

The sides of the bumper shall be finished with diamond plate.

AIR HORNS

Two (2) Hadley H00978 rectangular, chrome plated, air horns shall be provided.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

ELECTRONIC SIREN

One (1) Federal Signal e-Q2B 200-watt electronic siren shall be installed at the cab instrument panel complete with noise canceling microphone. The remote control head shall be flush mounted in a location specified by the fire department.

SIREN SPEAKER

One (1) Federal Signal BP200-EF 200-watt weatherproof siren speaker with Electric F grille shall be provided and wired to the electronic siren.

SPEAKER MOUNTING

The electronic siren speaker(s) shall be recessed in the front bumper.
FEDERAL Q2B SIREN

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

SIREN WIRED TO FOOT SWITCH

The mechanical siren shall be wired through a foot switch located on the officer and driver floor.

SIREN BRAKE SWITCH

A brake switch for the mechanical siren shall be provided in the lower command console for both the driver's and officer's position.

CAB EXTERIOR LIGHTING

Exterior lighting and reflectors shall meet or exceed Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements.

HEADLIGHTS

The front low and high beam headlights shall be FIRETECH model FT-4X6 LED, rectangular shaped, quad style installed in custom rectangular shaped stainless steel housings on the front of the cab. Each housing shall accommodate a forward-facing turn signal in the outboard location and a side-facing warning light.

An additional pair of rectangular shaped stainless steel housings shall be installed on the front of the cab above the headlight housings. Each housing shall accommodate two (2) forward-facing warning lights and a side-facing turn signal.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

FRONT TURN SIGNALS

There shall be four (4) Whelen 400 Series Model 40A00AAR LED rectangular amber turn signal lights mounted one (1) each side in the front of the headlight housings and one (1) mounted on the side of each warning light housing.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

ICC/MARKER LIGHTS

Five (5) ICC, LED marker lights shall be integrated in the brow light mounted on the front of the cab to meet D.O.T. requirements.

EXTERIOR CAB HANDRAILS

There shall be four (4) handrails. Sufficient space shall allow for a gloved hand to firmly grip the rail.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

INTERIOR CAB HANDRAILS

Two (2) 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 shall be approximately 11" long and the handrail on the officer's side shall be approximately 18" long.

CAB DOOR HANDRAILS

There shall be two (2) grab handles provided and mounted, one on the inside of each rear crew door, just below the windowsill. The handrails shall be approximately 11" long.

CAB REAR WALL COVERING

The rear outside wall of the cab shall be covered with 1/8" aluminum diamond plate.

DIAMOND PLATE, CAB ROOF

The rear exterior section roof of the cab shall have a diamond plate overlay.

CAB INTERIOR

The metal surfaces of the cab interior shall be coated and sealed with black or gray, urethane modified, mar resistant paint. The textured coating shall provide paramount durability and wear resistance against foreign objects and normal wear and tear.

The front and rear headliners, as well as the rear cab wall, shall be finished in black Embossed FRP board.

INTERIOR DOOR PANELS

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

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

REFLECTIVE MATERIAL, CHEVRON STRIPING, INTERIOR CAB DOORS, ORAFOL REFLEXITE

The apparatus shall have reflective Orafol Reflexite Chevron striping affixed to the inside of each cab door. The striping shall be plainly visible to oncoming traffic when the doors are in the open position.

CAB FLOOR COVERING

The cab interior floor shall be covered with a 5/16" thick, black rubberized material to provide a rugged but cosmetically pleasing stepping surface throughout the cab. The floor covering shall provide superior durability and resistance against foreign objects as well as normal wear and tear.

- Or equivalent to the above listed option.

ENGINE ENCLOSURE

The engine enclosure shall be contoured and blended in an aesthetically pleasing manner with the interior dash and flooring of the cab. The enclosure shall be kept as low as possible, to maximize space and increase crew comfort.

Additionally, the underside of the engine enclosure shall be coated in with a ceramic spray on insulation and sound control. This coating is an environmentally friendly coating that is applied seamlessly and rapidly while providing superior thermal insulation and protection against vibration and noise, and will prevent future corrosion from forming by sealing the substrate.

- Or equivalent to the above listed option.

ENGINE ENCLOSURE COVERING

The top of the engine enclosure shall be covered with Scorpion heavy duty, black polyurethane blended coating. The textured coating shall provide paramount durability and wear resistance against foreign objects and normal wear and tear as well as sound deadening and insulation. The rubberized cab floor covering shall extend up the lower exterior sides of the engine enclosure to aid in sound deadening and heat resistance.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

CENTER CONSOLE EXTENSION

There shall be an extension added to the center console area on top the engine enclosure between the driver and officer. The console shall be constructed from smooth aluminum and shall be coated with a durable coating to match the color of the engine hood covering and shall feature surfaces on each side that are contoured to face the driver and the officer for easy viewing and accessibility.

- Or equivalent to the above listed option.

SIDES OF EXTENSION

There shall be two (2) storage slots measuring 6"L x 2"W x 3"D each recessed into the upper portion of each side of the center console extension. One (1) slot shall be accessible to the driver and the other accessible to the officer.

- Or equivalent to the above listed option.

ENGINE HOOD LIGHTS

An LED work light shall be installed in the engine enclosure with an individual switch located on the base of the light.

WORK SURFACE

There shall be a flat work surface in front of the officer's seat.

UPPER CREW DOOR AREA

A glove box holder shall be provided in each upper cab crew door area. The holder shall be capable of holding two (2) EMS glove boxes.

CHASSIS WIRING

All chassis wiring shall have XL high temperature crosslink insulation. All wiring shall be color-coded, and the function and number stamped at 3" intervals on each wire. All wiring shall 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 shall be treated to prevent corrosion.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

MASTER ELECTRICAL PANEL

The main chassis breaker panel shall be wired through the master disconnect solenoid and controlled by the three-position ignition rocker switch. The breaker panel shall be located in front of the officer on the interior firewall and shall be protected by a removable aluminum cover. The cover shall have an aluminum notebook

holder on the exterior face accessible to the officer. The cover shall be painted with a durable finish to match the interior of the cab and shall be secured with two (2) thumb screws.

The breaker panel shall include up to 22 ground switched relays with circuit breaker protection. An integrated electrical sub-panel shall 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 shall be provided for cab light bar and other electrical items. If the option for a mechanical siren has been selected two (2) additional relays shall be provided.

Up to two (2) additional relay boards with circuit breaker protection shall be provided for additional loads as required. Each board shall contain four (4) relays. The relay boards shall 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 shall 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.) shall be provided.

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

All circuit breakers on the relay boards shall be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.
The system shall utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

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

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

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

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

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

INSTRUMENT PANEL

The dash shall be a one- piece hinged panel that tilts outward for easy access to service the internal components. The gauge panel shall be constructed with a scratch resistant reverse printed and laminated poly carbonate.

The gauges shall be AMETEK Vehicular Instrumentation Systems (VIS), Next Generation Instrumentation System (NGI) with built-in self-diagnostics and red warning lights to alert the driver of any problems. All gauges and controls shall be backlit for night vision and identified for function. All main gauges and warning lights shall be visible to the driver through the steering wheel.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

MASTER BATTERY & IGNITION SWITCH

The vehicle shall 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 shall be two (2) controls for the diesel particulate filter. One control shall be for regeneration and one control shall be to inhibit engine regeneration. These shall 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, Jacks Out, Jacks Down.

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 back lighting.

Controls included in steering column: Horn button, Turn signal switch, Hi-beam low-beam switch, 4-way flasher switch, Tilt-telescopic steering wheel controls

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

CENTER CONTROL CONSOLE

There shall be an ergonomically designed center control console. The console shall be mounted on the engine hood between the driver and officer. The console shall have a durable coating to match the color of the engine hood covering and shall 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 shall be mounted in removable. The console shall have a lift-up lid with quick release latch. The lid shall 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 shall 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 shall be provided above the driver and officer, running the full width of the cab. The overhead console shall be painted with a durable finish to match the inside of the cab. There shall be removable plates to house switches and other electrical items.

Directly above the driver there shall be two (2) panels with no cutouts, unless otherwise specified by the customer.

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

The center overhead panel shall be designated for up to seven (7) door ajar indicators. Upon releasing the apparatus parking brake, one or more of these lights shall 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 shall be a panel to the left of the officer as well as two (2) directly above the officer. These panels shall have no cutouts, unless otherwise specified by the customer.

ENGINE WARNING SYSTEM

An engine warning system shall be provided to monitor engine conditions such as low oil pressure, high engine temperature and low coolant level. Warning indication shall 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 shall 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.

DO NOT MOVE APPARATUS INDICATOR LIGHT

A Whelen LINZ6 LED style light shall be installed in the cab near the driver. The light shall illuminate when the parking brake is released and any cab or body door is open or any other item on the apparatus is not properly stowed that may cause damage.

DO NOT MOVE WARNING ALARM

A "Do Not Move Apparatus" alarm shall be installed in the interior of the cab.

MAP BOOK SLOT

A map book slot shall be installed on the officer's side of the cab.

PROGRAMMABLE LOAD MANAGER

Load manager shall have the ability to sequence loads on and off. The Super Node II has twenty-four (24) inputs and twenty-four (24) outputs. Eighteen (18) are positive polarity outputs and six (6) are ground polarity outputs. It shall also be able to establish a 8 priority levels to shedding loads when the vehicle is stationary, starting at 12.8 volts lowest priority load to be shed, then respectively at 12.7, 12.5, 12.3, 12.1, 11.9, 11.5 and never shed volts DC. An output is shed (turned OFF) when the system voltage drops below the designated priority level's shed voltage for thirty (30) seconds. If the voltage has dropped below multiple priority level shed voltages then each higher priority level will shed before the lower priority levels. An output is unshed (turned back ON) when the system voltage rises above the designated priority level's unshed voltage for ten (10) seconds. If the voltage has risen above multiple priority level unshed voltages then each lower priority level will unshed before the upper priority levels.

MASTER SWITCH

All outputs can be tied or not tied to the stage switch. In fire apparatus this switch is typically referred to as the master switch. The state of the stage switch is controlled by Utility Module output memory space 3.
When this output is active the stage switch is active. Any output tied to the stage switch will be OFF if the stage switch is not active regardless of the output's multiplex equation. Set an output to be tied to the stage switch by checking the stage switch box in its "Output Port Load Settings" under the "Settings" tab. The name of the stage switch can be changed from the standard "stage" to anything desired by modifying the text in the "Output Port Load Settings" area.

AUTOMATIC HIGH IDLE ACTIVATION

The Utility Module's high idle request (input memory space 2) is activated when the system voltage drops below the high idle threshold (12.8 volts standard or 25.6 volts if 24-volt load management is enabled) for 8 seconds or longer AND load management has been enabled (Utility Module output memory space 1 is active). The high idle request will remain active as long as the voltage remains below the voltage threshold and for 3 minutes after the system voltage rises above the voltage threshold. High idle can be canceled by activating the Utility Module's high idle cancel (output memory space 0).

HIGH IDLE

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

USB POWER POINTS

Four (4) 12-volt dual port USB power points shall be provided in the cab.

CAB ACCESSORY FUSE PANEL

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

POWER & GROUND STUDS, OVERHEAD COMMAND CONSOLE

There shall be a set of four (4) threaded power studs provided in the cab's overhead Command Console for future installation of two-way radios.

The studs shall be wired as follows:
- One (1) 12-volt 60-amp, direct to the battery ignition off.
- One (1) 12-volt 30-amp switched battery first position on ignition switch.
- One (1) 12-volt 30-amp ignition power second position on ignition switch.
- One (1) 12-volt 125-amp ground.

VEHICLE DATA RECORDER

An Akron / Weldon style vehicle data recorder as required by the 2024 edition of NFPA 1900 shall be installed. Vehicle data shall be sampled at the rate of 1 second per 48 hours, and 1 minute per 100 engine hours.

Free software is available to allow the fire department to collect the data as needed.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations

LIGHTING CAB INTERIOR

Interior lighting shall be provided inside the front of the cab for passenger safety. Two (2) Whelen 6" round ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens. One light shall be located over each the officer and driver's position. The lights shall also activate from the open door switch located in each cab doorjamb.

LIGHTING CREW CAB INTERIOR

Interior lighting shall be provided inside the crew cab for passenger safety. Two (2) Whelen 6" round ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens shall be provided. The lights shall also activate from the open door switch located in each cab doorjamb.

HEATER/DEFROSTER/AIR CONDITIONER

There shall be a minimum 65,000 cool BTU and 65,000 heat BTU single unit, heater/air conditioner mounted over the engine cover. The unit shall be mounted in center of the cab on the engine hood/enclosure. Unit shall have a shutoff valve at the right side of the frame, next to the engine. Airflow of the heater/air conditioner shall be a minimum 1200 CFM. To achieve maximum cooling, a TM-21 Compressor (10 cu. in.) will be used.

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

The condenser shall have a 65,000 BTU rating. Airflow of the condenser shall be a minimum 2250 CFM. (This condenser shall work at full rated capacity at an idle with no engine heat problems.)

- Or equivalent to the above listed option.

HEATER/DEFROSTER/AIR CONDITIONING CONTROLS

The heater/defroster/air conditioning shall be located in the overhead console in the center of the apparatus cab or within reach of the driver and officer. The controls shall be illuminated for easy locating in dark conditions. The controls shall 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 shall be achieved through these controls.

FLOORBOARD HEATING DUCT

There shall be duct work to the floor of the cab, facing forward to provide heat for the front of cab floor area.

DEFROSTER DIFFUSER

A molded diffuser made of durable ABS plastic duct work system shall be provided. It shall be form fitted and shall 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.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

TOOL MOUNTING PLATE

There shall be a 3/16" smooth aluminum plate installed on top of the heat/ air conditioning unit for use in mounting of equipment to match the over all cab interior.

DRIVER'S SEAT

A H.O. Bostrom Tanker 450 seat with air suspension shall be provided for the driver. The seat shall be equipped with a red 3-point shoulder harness with lap belt. The seat shall have fore/aft adjustment and shall be upholstered with heavy duty Low Seam Durawear Plus material.
Note: Retraction of the seat belt shall be from the inward location.

HELMET STORAGE

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

OFFICER'S SEAT

An H.O. Bostrom Tanker 450 ABTS SCBA seat shall be provided for the officer. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.
Note: Retraction of the seat belt shall be from the inward location.

UNDER SEAT STORAGE COMPARTMENT

There shall be a storage area under the officer's seat, accessible from the front through a hinged door with Southco C5 compression lever latch. The door shall be painted with a durable finish to match the inside of the cab and shall be vertically hinged near the engine enclosure.

HELMET STORAGE

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

REAR FACING EMS CABINET

A rear facing EMS cabinet shall be manufactured and installed behind the officer seat. The cabinet shall be equipped with two shelves and two LED light strips. The cabinet shall be painted to match the interior color of the rig.

- Or equivalent to the above listed option.

REAR FACING EMS CABINET

A rear facing EMS cabinet shall be manufactured and installed behind the driver seat. The cabinet shall be equipped with two shelves and two LED light strips. The cabinet shall be painted to match the interior color of the rig.

- Or equivalent to the above listed option.

CREW SEAT – DRIVER'S SIDE, FORWARD FACING, INBOARD

One (1) H.O. Bostrom Tanker 450CT ABTS SCBA seat shall be installed in the driver's side forward-facing inboard position. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.

HELMET STORAGE

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

CREW SEAT – OFFICER'S SIDE, FORWARD FACING, INBOARD

One (1) H.O. Bostrom Tanker 450CT ABTS SCBA seat shall be installed in the officer's side forward-facing inboard position. The seat back shall have a SCBA cavity and auto-pivot-and-return padded headrest. The seat shall be equipped with a red 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. The seat shall be upholstered with heavy duty Low Seam Durawear Plus material.

HELMET STORAGE

The helmet for the above seat shall be stored in a compartment. A placard shall be provided visible to the riding position warning that injury may occur if helmets are worn while seated.

SEAT UPHOLSTERY COLOR

The cab seat upholstery shall be black or grey in color.

SCBA BRACKETS

Each SCBA seat in the cab shall feature an H.O. Bostrom SecureAll self contained breathing apparatus (SCBA) locking system. The seat back shall include a bracket which shall be capable of storing most U.S. and international SCBA brands and sizes while in transit or for storage. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters; adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The locking system shall include a release handle integrated into the seat cushion for quick and easy release and to eliminate the need for straps or pull cords which might interfere with other SCBA equipment.

SEAT BELT WARNING SYSTEM

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

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

CREW SEAT COMPARTMENT

A compartment shall be provided under the forward facing crew seats on the back wall of the cab. Two outward opening doors shall be provided on the front face of the compartment.

IN-CAB OVERHEAD STORAGE AREA

An overhead storage area shall 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 shall be approximately 84" wide x 10.5" high x 17" deep.– Removable nylon netting shall be provided to cover the storage area opening.
Specific dimension to be determined in pre-construction meeting.

ANTENNA MOUNTING

The customer supplied radio antenna shall be installed in the cab roof with the coax cable run to the radio mounting area. The radio location shall be determined at the pre-construction meeting.

ELECTRICAL PROVISION

Wiring shall be provided in the cab for the future installation of electrical chargers. The location shall be determined during the pre-construction conference.

COMMUNICATION SYSTEM

Installation of customer furnished radios.

A Firecom 5200D four (4) position wired intercom system shall be provided and installed by manufacturer on the apparatus. The system shall service four (4) cab seat positions. The driver and officer shall have radio transmit capabilities. The two crew seats shall have intercom only capabilities.

The system shall include the following components:
(1) 5200D intercom master station
(1) UH-51S headset for driver and officer
(1) UH-51 headset for officer
(2) UH-52 headsets for crew
(4) HM-10 plug modules in the cab
(2) Mobile radio interface cable as required
(4) Headset hooks

REAR & SIDE VISION CAMERA SYSTEM, THREE CAMERAS

There shall be an Intec three (3) camera color rear and side vision camera system installed on the apparatus. The system shall include one (1) 6.4" CVD640LCD color display mounted in the cab in plain view of the driver. The display shall incorporate an automatic brightness control. One (1) model CVC500AH color camera shall be installed at the rear of the apparatus to provide clear and unobstructed view behind the rear of the apparatus while backing. One (1) model CVC500AHS-1 color camera shall be installed on the left side of the apparatus and one (1) model CVC500AHS-2 color camera shall be installed on the right side of the apparatus. Each camera shall deliver a usable color picture at a scene illumination of 0.5 Lux over entire horizontal field of view of at least 123° and a vertical field of view of at least 91°. Each camera shall provide an audio function and be equipped with stainless steel mounting bracket and sunshield. The cameras shall be equipped with a thermostatically controlled heater and the camera operating temperature range shall be - 40C - +75C. The system shall activate when the transmission is shifted into reverse and stay active until the transmission is shift to another position. Additionally, the left side camera shall activate with the left turn signal and the right camera shall active with the right turn signal. A switch on the remote shall activate the system regardless of transmissions shift position. The system shall include one (1) CVS500H Multi-Channel Controller (capable of supporting up to 5 cameras) and one (1) CVR500 Remote Control. A CVH series polyurethane cable of appropriate length shall be included between each camera and controller. The system, including the cameras, display, controller, remote control and cables, shall be RoHS compliant, FCC, CE, e- mark, and IP68 waterproof certified and carry a five (5) year warranty.

- Or equivalent to the above listed option.

OFFICER OUTRIGGER CAMERA AND SPOTTING LIGHTS

There shall be a camera on the officer side body mounted above the outrigger. There will also be a camera monitor in the outrigger compartment to aid the operator in placing the outrigger. There shall also be outrigger spotting lights that indicate where the outrigger pads will go.

TOWER INLETS

There shall be a 5" inlet pipe with 6" NST threads on both sides of the apparatus.

AKRON REVOLUTION BALL INTAKE VALVE

(2) Akron Brass Style 7982 Intake Valve shall be provided. The Intake Valve shall be constructed of lightweight, corrosion-resistant, hard-anodized aluminum and stainless steel. The truck side of the valve shall be 6” NST and the inlet shall be 5” Stortz. The valve shall also come with a 30 degree swiveling elbow inlet.

INLET ADAPTER

(2) Task Force Tips #AH3ST-NX 6” NST female x 5” Storz 30-degree adapter with #A01ST 5” Storz cap and chain shall be provided for the above inlet.

WATERWAY VALVE AND ACTUATOR

The waterway valve shall be an Akron 3" electric valve. The valve shall be controlled by an Akron Navigator 9335 electric actuator located at the operator’s panel. The actuator shall be connected to both a flow sensor and a pressure sensor. The actuator shall display pressure, flow, and valve position on a full color LDC display. Or equivalent

WATERWAY DRAIN VALVE

An Akron 1.5” waterway drain valve shall be provided and controlled with a push/pull handle.

WATERWAY MANIFOLD INLET PANEL GAUGES AND CONTROLS

The following gauges and controls shall be provided at the inlet panel:
Waterway drain control.
Waterway pressure gauge.
Waterway flowmeter.

COMPRESSION FITTINGS ON AIR SYSTEM

Compression style fittings shall be provided on air lines within the pump module.
- **NO EXCEPTIONS**

AERIAL BODY SUB-FRAME

The chassis shall be fitted with a sub-frame system consisting of a series of mild steel legs, extending down and out from the chassis frame rails on each side. A heavy-duty rear platform shall be constructed of the mild steel to support the rear compartments. Self-supporting bodies will not be acceptable.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

APPARATUS BODY

All side metal, compartments and compartment floors shall be of bolted stainless steel. The body shall be assembled with heavy-duty stainless steel channel sills with bracing for extreme rigidity and mounted on a steel subframe.
The compartment body and the engine compartment shall be separate modules (segmented body design) that are not to be fastened together in any manner in order to provide "flex joints" to alleviate stress and cracking of body compartments and running boards. Compartments shall extend from the front jacks to the tailgate of the apparatus and shall be recessed to the frame of the apparatus where possible.
Compartments shall have sweep-out flooring (no obstruction at the floor bottom). Each compartment shall be properly vented with louvers.
Note: Stainless Steel Body Preferred

COMPARTMENTS

There shall be a minimum of 300 Ft3 with one adjustable shelf per cabinet. Specific layout of compartments shall be determined during pre-construction. All roll up doors shall be AMDOR brand. There shall be (4) Slide-Master pullout drawer provided and installed. The drawer shall have a distributed load capacity of 600 lbs. and be capable of extending 100% of its depth. The tray shall be fabricated with a minimum of .188" aluminum plate and have a formed lip that measures 2".

COMPARTMENT MATTING

Turtle Tile interlock matting material shall be provided in the compartment.

COFFIN COMPARTMENTS

Four coffin compartments will be mounted on top of the officer and driver sides of the body compartments. They will measure approximately 20” deep x 90” long x 16” tall. There will be two hinged aluminum lift up doors accessible from the side of the truck.

UNISTRUT

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

COMPARTMENT DOORS, ALUMINUM

The compartment doors shall be box pan construction, made of 5052-H32 aluminum. The inner door pan shall be securely welded to the outer door skin. A reinforcement shall be installed in the center of the door to stabilize the door pan and to deaden the sound when closing the door. Doors under 60” tall will have single point latches, doors 60” tall and over will have double latches. The door hinge shall be polished stainless steel. The hinge shall be attached using stainless steel bolts. The door shall 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) shall be provided on all compartments. Gas strut cylinder arms shall be mounted on each swing out compartment door. Compartments shall have full-length stainless steel hinges. A door open indicator light shall be provided in the cab.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

COMPARTMENT LIGHTING

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

- **NO EXCEPTIONS**

110 VOLT OUTLETS

Four (4) Duplex 110-volt outlets shall be installed in the body compartments. The exact location shall be determined at the pre-construction conference.

BODY HANDRAILS

Handrails shall be constructed of type 304 stainless steel.

RUB RAILS

The body shall be equipped with UHMW poly rub rails at the sides. The rub rails shall be black in color.

ALUMINUM TREADPLATE

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

Tread plate locations:
1. Skirting around front bumper.
2. The step at the cab entrance.
3. The jump seat steps.
4. The running boards.
5. The top of the compartments.
6. The top of the turntable.
7. The floor of the platform.

- Or equivalent to the above listed option.

WHEEL LINERS

Fiberglass fully radiused wheel well liners with adequate support to maintain their rigidity through adverse weather conditions shall be provided.

SCBA CYLINDER COMPARTMENTS

There shall be not less than six spare (1 hour) breathing air cylinder compartments recessed in the rear fender wells.

DOOR FINISH

The single or double SCBA compartments shall have a brushed stainless door equipped with a weather resistant flush fitting thumb latch. The interior of the door shall incorporate a rubber seal to keep the compartment free of road debris and moisture.

- Or equivalent to the above listed option.

FENDER PANELS

The rear side fenders shall be removable smooth stainless panels, painted truck color.

GROUND LADDERS

Apparatus shall be capable of carrying minimum of 149 feet of ground ladders to meet the requirements of NFPA. The following ladders shall be provided.

DUO-SAFETY LADDERS
One (1) 10 ft. folding ladder, Series 585A
Two (2) 16 ft. roof ladders, Series 875A
Two (2) 18 ft. roof ladders, Series 875A
One (1) 20 ft. roof ladders, Series 875A
Two (2) 28 ft. 2-section extension ladder, Series 1200A
One (1) 35 ft. 2-section extension ladder, Series 1200A
A 16 ft. roof ladder shall be mounted on the side of the base section of the aerial.

LADDER ENCLOSURE

The ground ladders shall be stored within a weather resistant enclosed area. The ladders shall be mounted on non-metallic slides so each ladder can be removed individually. All ladders shall be stored on beam if possible. A vertically hinged treadplate door shall enclose the ladders on the rear.

LADDER CHUTE DOOR

A smooth door shall enclose the ladders at the rear.

LICENSE PLATE BRACKET

A license plate bracket with LED light shall be provided at the rear of the apparatus.

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 shall 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 shall be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall 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 shall 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 degrees 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.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

BACK-UP ALARM

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

STOP/TAIL/TURN/REVERSE LIGHTS

The rear stop/tail/turn/reverse lights shall be Whelen M6 series lights installed in quad housings one (1) each side on the rear of the apparatus body. The stop/tail lights shall be LED model M6BTT located in the top position of the housing. The amber arrow turn signals shall be LED model M6T located below the stop/tail lights. The reverse lights shall be LED model M6BUW located below the turn signals. The bottom position of the housing shall accommodate a Whelen M6 series warning light.

LED ICC/MARKER LIGHTS

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

FLEXIBLE MARKER LIGHTS

A Britax L427.200.L12V LED flexible marker light shall be mounted on the rear lower corners of the body, one each side.

STEP LIGHTS

The running board area shall 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 or individually mounted lights shall be provided at the rear of the body to illuminate all stepping surfaces.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

GROUND LIGHTING

The apparatus shall be equipped with lighting capable of illumination to meet NFPA requirements. Lighting shall be provided at areas under the driver and crew riding area exits and shall be automatically activated when the exit doors are opened. The ground lights shall be Amdor Lumabar H20 LED. Lighting required in other areas such as work areas, steps and walkways shall be activated when the parking brake is applied, provided the ICC lights are on.

- Or equivalent to the above listed option.

REAR WORK LIGHTS

Two (2) FireTech WL-2000-F-B LED flood lights shall be provided. One (1) shall be mounted on each side on the upper rear of the apparatus body. The lights shall be activated by a switch inside the cab near the driver.

Zone A (front) shall have one (1) Whelen Freedom IV 72" Model F4N7QLED light bar, with sixteen (16) LED modules. The light bar shall have two (2) end red LED modules, two (2) corner red LED modules, ten (10) forward-facing red LED modules and two (2) forward-facing white LED modules. The light bar shall have all clear outer lenses. The light bar shall be installed on the cab roof as far forward as possible with two (2) MK8H 5" cast aluminum risers.
Zone B (officer's side) shall be covered by the module from the light bar and the rear beacon.
Zone C (rear) shall have two (2) Whelen Model MCFLED2* Micro Freedom LED beacons installed one (1) each side on the upper rear of the apparatus. Each beacon shall feature two (2) rear-facing corner LED modules.
Zone D (driver's side) shall be covered by the module from the light bar and the rear beacon. Zone A (front) shall have four (4) Whelen M6 series model M6* Super LED warning lights.
The lights shall be installed two (2) each side on the front of the cab in the warning light housings. Zone B (officer's side) shall have four (4) Whelen M6 series model M6* Super LED warning lights.
The lights shall be installed one (1) near the front corner of the apparatus, one (1) under the turntable area, one (1) near the rear axle, and one (1) near the rear corner of the apparatus.
Zone C (rear) shall have two (2) Whelen M6 Series model M6* Super LED warning lights installed one (1) each side on the lower rear of the apparatus.
Zone D (driver's side) shall have four (4) Whelen M6 series model M6* Super LED warning lights.

The lights shall be installed one (1) near the front corner of the apparatus, one (1) under the turntable area, one (1) near the rear axle, and one (1) near the rear corner of the apparatus.

BROW MOUNTED LED SCENE LIGHT

One (1) Fire Research Spectra SPA811-Q20 brow mounted LED scene light shall be provided. The lamp head shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. The light shall be mounted at the front brow of the cab and shall be controlled from a switch in the cab.

SCENE LIGHTS

A pair of Whelen M9 LED scene lights shall be installed.

GTT GPS OPTICOM

A Global Traffic Technologies GPS Opticom shall be provided and installed on the apparatus. The unit shall be of the type currently used by the Kenosha Fire Department.

- **NO EXCEPTIONS**

ADDITIONAL 3-WAY SWITCHES

Six (6) additional 3-way switches shall be provided per the customer's location.

GENERATOR

The apparatus shall be equipped with a complete electrical power generation system.

A Harrison hydraulic 8.0 KW generator model MAS – 16R/5A shall be provided and installed. The generator and wiring shall conform to present National Electric Codes as outlined in the National Fire Protection Association Standards.

The output of the generator shall be controlled by an internal hydraulic system. An electrical instrument gauge panel shall be provided for the operator to monitor and control all electrical operations and output. The generator shall be powered by a transmission power take off unit, through a hydraulic pump and motor. The generator shall be operable anytime that the apparatus engine is running and meeting the minimum range of 900 RPM's.

Max kW 8.0
AMPS@120V 68
AMPS@240V 34
HP Required 16
Torque Required 68 Maximum Pressure 2800 psi

BREAKER BOX

A circuit breaker box shall be Square D QO panel and shall be provided with eight (8) spaces for GFI breakers which shall be provided as needed. All wiring shall be installed in liquid tight conduit.

BREAKER PANEL

The breaker panel shall be determined at pre-construction and shall meet all requirements set forth by the National Electrical Code and NFPA guidelines.

CORD REEL

There shall be a Hannay Model ECR1616-17-18 electric rewind cable reel furnished and mounted in a compartment. The reel shall come complete with 150 feet of 10/3 Seoprene Water-resistant (SOW) yellow jacketed cable. A Hannay Type "C" roller assembly and HS-3 cable stop ball shall be provided.

REEL MOUNTING

The specific mounting location shall be determined at the pre-construction.

AERIAL LADDER DEVICE

An aerial ladder device with a minimum 100-foot vertical reach shall be provided. The height dimension shall be calculated with the boom at 80 degrees. The horizontal reach of the device shall not be less than 93 feet, 6 inches. **The overall height of the apparatus with the aerial device in the bedded positions shall be no more than 11 feet 5inches and the overall length of vehicle shall be not more than 46 feet, 6 inches.**

- **NO EXCEPTIONS**

TELESCOPING AERIAL

An elevated ladder of the telescopic design shall be provided. The overall length of the aerial fully retracted at 0-degree elevation shall not exceed 29 feet.

These particular shorter lengths shall be important for allowing the ladder to be positioned in tight or confined spaces associated with lower degrees of elevation. There shall be no welding on the ladder so as not to lower the yield strength of the material and cause torsional fracture, grain distortions and unequal conductivity. The ladder rungs shall be constructed form a solid extrusion and shall have an oval serrated profile. The rungs shall be spaced on 14 in. (356-mm) centers and shall have a minimum outside diameter of 1-1/4 in.(32- mm) including the surface. The minimum design load per rung shall be 500 lb (227 kg) distributed over a 3 1/2 in. (89-mm) wide area at the center of the length of the rung with the rung oriented in its weakest position.

Top rails shall be provided on the ladder, shall have a minimum width of 1 in. (25 mm), and shall be at a minimum height of 17 in. (305 mm) above the center line of the rungs.

Two folding steps with skid-resistant surfaces shall be provided on the ladder for the use of the waterway-monitor operator. Each folding step shall have a minimum design load of 500 lb (227 kg) and shall be a minimum of 35 sq in. (22582 mm2) in area.

The rated horizontal reach of an aerial ladder shall be measured in a horizontal plane from the center line of the turntable rotation to the center line of the outermost rung on the fly section with the aerial ladder extended to its maximum horizontal reach.

The ladder shall be left in a natural aluminum finish and painting the ladder shall not be acceptable. The ladder shall have the capability to shed massive ice buildup during freezing conditions.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

LOAD LIMITATIONS

Load instruction plates shall be located at the turntable pedestal control station, indicating the recommended safe load of the ladder. The ladder shall carry the rated load capacity indicated in the following manner: raise, extend, rotate, retract and lower without exceeding the hydraulic pressures prescribed by the manufacturer. THE LADDER SHALL HAVE A CAPACITY OF 750 LBS. DRY AND 500 LBS. WHILE FLOWING WATER.

ADDITIONAL INFORMATION. Ladder shall be capable of being rotated in any direction and the ladder capable of being raised or lowered ---ALL AT THE SAME TIME.

RAISING AND LOWERING

The raising and lowering mechanism shall consist of two large hydraulic cylinders attached to the ladder so that 50% of the lifting force effort is applied towards raising the ladder and it shall raise the complete load, 750 lbs., with ladder at full horizontal reach. Cylinders shall be mounted so that the cylinder rods are attached to trailing beams of the ladder steel side plates.

As a safeguard feature, the lifting system shall be structurally and hydraulically designed and mounted to prevent rapid descent (lowering) of the ladder unit, in the event of hydraulic hose breakage. In the event of failure of any raising mechanism during operation, the gravity descent of the ladder shall be kept at a speed, which shall prevent damage to the equipment or danger to personnel. Provisions shall be made to prevent damage at full raise or lowering.

EXTENSION AND RETRACTION

The ladder shall be extended by dual hydraulic rams.

LOWER TURNTABLE SUPPORT ASSEMBLY

The main frame assembly shall be a solid welded steel box beam structure with welded support gussets fore and aft extending across the chassis frame 35" x 50" in depth. The solid steel box beam structure measurements are important to take shock loads imposed by water turret operation and to give a reserve strength factor to compensate for hose breakage and water hammer. The overall height of the mainframe assembly measured from ground level to the turntable assembly shall not exceed five feet.
This is important in order to keep the center of gravity as low as possible, thus giving the truck superior handling characteristics. An open tube or angle substructure for the mainframe assembly shall not be acceptable. The mainframe assembly base plate, located at the top of the assembly, which supports and holds the turntable rotation bearing, shall be minimum 1" steel. There shall be a minimum of two solid two inch square tension and compression bars mounted underneath, fore and aft, of the mainframe assembly, which shall tie the ladder and chassis together. The bars shall function to withstand vertical torsional loads. The forward tension and compression bar shall be attached from the rear area of the front spring suspension hanger to the underside area of the mainframe assembly. The rear tension and compression bar shall be attached from the forward area of the rear spring suspension hanger to the under side area of the mainframe assembly.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.

- Or equivalent to the above listed options.

TURNTABLE

The turntable shall be a minimum of one-inch thick plate and ninety-four (94) inches in diameter. The side plates to which the main base section of the aerial ladder is connected shall have a minimum height of two feet and shall include gussets that shall tolerate the side thrust and tremendous forces to which the unit shall be subject. The turntable shall be equipped with two removable steel sections for access into the pump.

The turntable side plates shall be positioned at a 45-degree angle (opposite the angle of the raise/lower cylinders) to act as a partial counter balance weight on the opposite side of the truck from the ladder extension.

The turntable shall be equipped with a rotating mechanism with a steel balanced fly wheel connected at one end which shall rotate the turntable 360 degrees through a planetary gear box that shall handle torque loads imposed by water hammer and hose breakage. The rotating mechanism shall give the turntable and ladder built in coast as an added safety precaution to avoid lateral ladder side-to-side deflection (reactionary whipping effect) caused by the ladder being stopped suddenly.

The power-operated turntable shall provide continuous rotation of the ladder structure clockwise or counter clockwise, thus enabling the structure to be positioned in any segment through 360 degrees. The rotating mechanism shall also provide sufficient power to rotate the ladder sections in any direction any angle, fully extended, while carrying the manufacturer's rated load capacity with the waterway in operation and discharging water at the tip of the ladder fly section.

Provisions shall be made for manual operation of the rotation system should loss of hydraulic power occur. This shall be done through manual rotation of the flywheel to rotate the ladder and turntable. There shall also be an emergency means of retracting the ladder and an auxiliary bleed down valve for the hydraulic raise/lower cylinders. There shall be a minimum of two heavy-duty steel shafts that shall attach the base section of the ladder (at the top and very back) of the ladder to the top portion of the turntable side plates together. The minimum steel shaft measurement shall be 4" long X 3" diameter.

The complete rotation system shall have built in relief to prevent damage from rotating the ladder into buildings or from overloaded water streams. Suitable indicators, clearly visible at all times, shall be provided to facilitate correct alignment of the turntable with the bed of the ladder. An automatic light shall be used to show correct alignment for bedding of the ladder from the turntable control station and the ladder station.

The turntable rotation mechanism shall be provided with an automatically applied brake or self-locking drive. It shall provide braking capacity with all power systems non-functioning to prevent turntable rotation under all rated conditions of loading.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

TURNTABLE BEARING

The turntable bearing shall be constructed of steel. The diameter of the turntable bearing shall be a minimum of 42". The turntable bearing shall be able to rotate 360 degrees in either direction on one-inch thick stainless steel ball bearings. The turntable bearing shall be bolted to the top of the mainframe assembly using a minimum of Grade 8 bolts.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

ROTATION LIMITING SYSTEM

An aerial rotation limiting system shall be provided to notify and prevent the operator from rotating the aerial into a restricted position due to a "short-set" outrigger configuration. The system shall enable the operator to place the aerial in 180-degree rotation to the opposite side of the apparatus than that of the "short-set" outriggers only.

The aerial shall automatically slow down when it approaches the limit of rotation travel.

The system shall be capable of rotating the aerial two degrees past the center line of the apparatus on the "short-set" side to enable bedding of the aerial within the travel support structure without system cutout. Audible warning alarms and LED indicators shall be provided to warn the operator they have reached the rotation limit and can also be used to assist with set-up and troubleshooting of the system.

SMART BOOM WARNING SYSTEM

This system shall warn both audibly and visually of impending contact with either the cab or the body of the truck.

When in an area of impending contact, the system shall shift the aerial controls into a reduced speed "creep mode" but shall not limit travel of the aerial.
Both rotation interlock and the smart boom warning system shall display information on a visual LED information center mounted at the turntable control pedestal.

ROTATION LIMITING ALARM

An audible warning alarm and LED indicators shall be provided to warn the operator they have reached the rotation limit and can also be used to assist with set-up and troubleshooting of the system.

HYDRAULIC SWIVEL

The aerial device shall be equipped with a multi-port hydraulic swivel which shall connect the hydraulic lines from the hydraulic pump and reservoir to the aerial control bank. The hydraulic swivel shall allow for 360 degrees of continuous rotation of the aerial device with no loss of speed or capacity in its function. Aerial control bank is located on the turn table.

ELECTRIC SWIVEL

The ladder shall be equipped with an electric swivel to allow for 360 degrees of continuous rotation of the aerial while connecting all electrical circuits through the rotation point. A programmable controller will manage operation designed specifically for each truck. Envelope control is provided though the programmable controller, sensors, and an encoder.

HYDRAULIC SYSTEM

A flange mounted hydraulic pump, which shall be driven by a power take off unit that is connected to the chassis transmission to provide the power required for operating the ladder. A PTO hour meter shall be provided to record the time when the aerial hydraulic system is engaged.

Said hydraulic system shall have a minimum hydraulic reservoir capacity of sixty-five gallons of special hydraulic fluid. The hydraulic fluid shall be discharged through a refined filter, plus fine mesh stainless steel strainers.

Within said system, pilot operated check valves shall be incorporated so that all valves shall hold in their respective function(s). The hydraulic system shall also incorporate automatic bypasses to compensate in case the ladder is forced into a building or should operator accidentally throw control valve in opposite direction at full speed. All hydraulic lines shall be of the double braided type with synthetic cover rated at 10,000 lb. burst pressure or above. A means shall be provided for readily checking and filling the hydraulic reservoir.
The fill location shall be conspicuously marked "Hydraulic Oil Only." The manufacturer shall provide proper instructions for checking and filling the hydraulic reservoir.

AUXILIARY HYDRAULIC POWER

A 12-volt auxiliary pump shall be provided to supply emergency power to the hydraulic system. This system shall be operated off the truck batteries and provide limited adequate power to operate the ladder and stabilizer jacks under emergency conditions.

The auxiliary hydraulic motor shall be located in the stabilizer control station compartment on the left side of the vehicle, next to the jump seat entrance for ease of accessibility and maintenance.

INTERLOCK

An interlock shall be provided that prevents operation of the aerial device until the chassis spring brakes have been set and the transmission has been placed in neutral or the transmission is in the drive position with the driveline to the rear axle disengaged.

A power operated governed engine speed control shall be provided to power the aerial device at normal operating speeds as determined by the manufacturer and this standard.

An interlock shall be provided that allows operation of the engine speed control only after the chassis spring brakes have been set and the transmission is in neutral.

When the unit is equipped with a fire or attack pump, the governed speed control shall be automatically disengaged when the fire or attack pump is operating.

An interlock system shall be provided to prevent the lifting of the aerial device from the travel position until all the stabilizers are in a configuration to meet the stability requirements. The interlock system shall also prevent the moving of the stabilizers unless the aerial device is in the travel position.

STABILIZERS

Individual control valves shall be supplied for each mode of stabilizer operation. There shall be a plaque located next to each control valve displaying the function.

A two position hydraulic transfer valve (diverter valve) shall be installed adjacent to the stabilizer control station to direct hydraulic power to either the stabilizer operations or the ladder operations in order to prevent operation of both circuits at the same time.

There shall be controls located at the stabilizer control station:

(a) On/off switch for auxiliary hydraulic motor
(b) High speed control for hydraulic system
(c) On/off switch for electrical power to pedestal and ladder

Each stabilizer jack shall be furnished with a holding valve and a manually positioned steel pin lock. The pin lock safety feature is designed to not let the stabilizer jack retract should the holding valve bleed off slowly or suddenly.

The extendable jacks shall be designed that they may be operated simultaneously on both sides of the apparatus and horizontally to accommodate obstructions such as curbs, pavement depressions, parked vehicles or any other hindrance.

Any I-beam or contributing structural member, through which the jacks support the weight of the ladder or any position of the apparatus plus the live loads peculiar to firefighting operations, shall be of ample strength to carry these loads without evidence of stress, bending, twisting or other failure(s). As mentioned before, pilot operated check vales shall be included on each jack cylinder and manual pin locks shall be provided for each main stabilizer jack, as additional safety.

There shall be two jack pads of light weight material, one mounted in each stabilizer jack compartment.

The following stability requirements shall be met by the aerial apparatus when it is in a service ready condition, but with all normally removable items such as water, hose, ground ladders, loose equipment, etc., removed. Items mounted on the aerial device by the manufacturer shall remain mounted.

The aerial device shall be capable of sustaining a static load 1-1/2 times its rated capacity in every position in which the aerial device can be placed when the vehicle is on a firm and level surface.

The aerial device shall be capable of sustaining a static load 1-1/3 times its rated capacity in every position in which the aerial device can be placed when the vehicle is on a slope of 5 degrees downward in the direction most likely to cause overturning.

The controls shall be arranged so that the operator may view the stabilizers in motion.

The stabilizers shall be deployed in not more than 90 sec. from a stored position to the operating position.

All parts of the stabilizers that protrude beyond the body of the apparatus shall be striped or painted with reflective material so as to indicate a hazard or obstruction.

Stabilizers shall be provided with one or more red warning light(s) visible on the side of the vehicle where the stabilizer is located.

AERIAL JACKS ALARM

An Ecco DT500 alarm shall be audible when the aerial jacks have been deployed either in the short jack mode or in fully deployed operations.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed option.

PEDESTAL CONTROLS FOR LADDER OPERATION

An aerial ladder operator's position shall be provided on the apparatus so that the operator is not in contact with the ground. Sign(s) shall be placed to warn the operator(s) of electrocution hazards.

Indicating devices, suitably lighted, clearly marked, and conveniently arranged shall be visible from the operator's position to:

(a) Indicate rungs are aligned for climbing
(b) Indicate the alignment of the aerial ladder with the travel bed
(c) Indicate elevation and capacity ratings or provide an equivalent load indicating system.

The three pedestal controls shall control the functions of hoisting and lowering, extending and retracting, and rotation of the ladder sections. A guardrail shall be provided at the turntable pedestal control station to prevent personnel from accidentally falling off the vehicle.

The turntable pedestal controls shall be of the manual override type. The control valve employed is the proportional type, which shall allow feathering characteristics during any operation.

The pedestal control station shall have removable panels for access to the hydraulic lines, valves and electrical wiring. There shall also be a hinged cover at the top of the control station for additional access.

The pedestal control station shall be situated so the operator can easily observe the ladder while operating the controls.

Controls suitably lighted, clearly marked, and conveniently arranged shall be provided at the operator's position in order to:

(a) Elevate and lower the aerial device
(b) Extend and retract the aerial device
(c) Rotate the aerial device in either direction
(d) Operate intercom

The following additional items shall be mounted at the turntable pedestal control station:

(a) On/off control switch for light to display control station for nighttime operation
(b) On/off control switch for ladder lights, one light mounted on each side of the ladder
(c) On/off control switch for high-speed control of the hydraulic system
(d) A communication system with controls at both locations Plaque displaying functions for pedestal ladder operation

INCLINOMETER

An illuminated inclinometer shall be provided and mounted in plain view of the pedestal operator location.

CENTRALIZED LOCATION OF ALL GROUND CONTROLS

All stabilizer jack controls, turntable pedestal controls and pump controls shall be located in one centralized area to:
(a) Allow close proximity to all control stations of the truck.
(b) Allow faster set up time for all operations of the truck.

SIGNS AND PLAQUES

Legible, permanent signs that provide operational directions and warning and caution shall be installed in positions readily visible to the operator(s).

Operational direction signs shall describe the function of each control and provide operating instructions.

Warning and caution signs shall indicate hazards inherent in the operation of the aerial ladder. These hazards may include but not be limited to:

Electrical hazards involved where the aerial ladder does not provide protection to the personnel from contact with or near proximity to an electrically charged conductor.

Electrical hazards involved where the aerial ladder does not provide protection to ground personnel who may contact the vehicle when in contact with energized electrical conductors.

Hazards from stabilizer motion.

Hazards that may result from failure to follow manufacturer's operating instructions.

Identification signs shall disclose the following information relative to the aerial device:

1. Make
2. Model
3. Insulated or non-insulated
4. Serial Number
5. Date of manufacture
6. Rated load capacity
7. Rated vertical height
8. Rated horizontal reach
9. Maximum hydraulic system pressure, if applicable
10. Hydraulic oil requirements, if applicable

OPERATIONAL TEST

After starting the engine, setting the jacks and transmitting power to the aerial, a complete cycle of the aerial operation shall be carried out as follows: With one person operating the machine from the control station, raise the aerial from the bedded position, rotate 90 degrees and extend to full height. This shall be completed in less than 150 seconds, smoothly without vibration.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

QUALITY CONTROL

The quality control program shall include 100 percent nondestructive testing of all critical structural components of the aerial ladder. The manufacturer shall determine the types of nondestructive testing (NDT) to be conducted. The procedures used for NDT shall comply with the appropriate standards defined in current NFPA standards upon delivery. All NDT procedures shall be fully documented with respect to extent of examination, method of testing, and inspection techniques. An ASNT Level II NDT technician certified in the test latest methods shall perform all testing. All NDT testing shall be done in accordance with the American Society for Nondestructive Testing SNT-TC-1A, Recommended Practice.

Certified welders under the guidelines of AWS D1.1, Structural Welding Code--Steel, and AWS D1.2, Structural Welding Code--Aluminum, shall perform Welds for all structural load-supporting elements.

WATERWAY

The aerial waterway shall be constructed of heavy duty, light weight, telescopic, aluminum tubing. The water supply line shall come directly off the main pump discharge manifold and shall be piped through smooth high pressure piping without the use of 90 degree chicksan joints, to reduce friction loss. The water flow shall be controlled by a full flow ball valve to eliminate any possibility of water hammer on the waterway.
The water shall be passed through a special 4" passage rotating swivel designed to also provide hydraulic passages and electrical circuits to the turntable.

Waterway piping immediately above the hydraulic swivel shall have one 90 degree elbow connected to a straight pipe attached to a reinforced stainless steel braided flex tube. There shall be no chicksan swivels or multiple bends or twists of the waterway pipe immediately above the hydraulic swivel, which would increase friction loss.

The base section of the waterway shall be a 5" minimum diameter and finish with a 3" diameter in the fifth section of the aerial. The base section shall completely enclose the first section of waterway, thereby protecting it from possible damage from buildings, roof cornices, etc. An automatic relief valve shall be provided in the waterway to eliminate any damage to the waterway by pressure shock or retracting the boom with the drain valve closed.

The waterway shall have the capability of flowing a minimum of 1000 gallons per minute.

POSITIONABLE WATERWAY

The waterway shall have the capability of being secured to the fourth or fifth section of the aerial by means of a lever operated positive locking device. To further enhance the safety of personnel working near the aerial, a permanent stop shall be provided at the end of the ladder, to prevent the waterway from leaving the aerial device.

A simple locking pin system shall not be acceptable.

AERIAL SPOT LIGHTS

Four (4) Rigid Industries D2 LED spot lights shall be provided. One (1) shall be mounted on each side of the aerial base section and one (1) each side at the monitor bracket to illuminate the aerial device for night time operation. The lights shall be activated by a switch near the aerial operator's station.

LADDER LIGHTING SYSTEM

The climbing ladder shall be illuminated by FireTech FT-WL-2000-S-B 12V LED lights. The lights shall be spaced along the length of the boom to provide even lighting. The lights shall be activated by one (1) switch at the pump panel.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

MONITOR/NOZZLE

An Elkhart #7205 Cobra lightweight monitor shall be provided. It shall be attached to the end of the aerial with a 4-bolt flange. This monitor shall be capable of full flow of the aerial waterway up to 1500 G.P.M. Positioning of the monitor shall be accomplished through electric controls located at the aerial tip, pump panel and hand held transmitter.

This monitor shall be equipped with an Elkhart SM-1500E nozzle. The nozzle shall have automatic flow rates of 350 - 1500 G.P.M.

This monitor shall be equipped with a Smoothbore stacked tips nozzle (brand to be determined by customer at a later date).

INTERCOM

A Fire Research ACT Intercom model ICA900-112 two-way system shall be installed between the aerial operator's position and the monitor bracket. The intercom kit shall include two control modules, one that is hands free and one that has a push-to-talk button, two speakers, and cables. The interconnection between control modules shall require two wires. The control modules shall have an LED volume display and push-button volume control. The hands free module shall constantly transmit to the other module unless the push-to-talk button is pressed.
The intercom shall be designed for exterior use. The control module shall be no more than 2 7/8" high by 5 1/8" wide by 1 7/8". The speaker shall be no more than 5 1/8" high by 5 1/8" wide by 1 1/2" deep. The power requirements for each control module with a speaker shall not exceed 1/2 amp at 12 VDC.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

LIFTING RINGS

A double lifting ring shall be attached to the last section of the aerial with two rings for the purpose of lifting a stokes basket. The capacity of the rings shall be 250 pounds each, for a total of 500 pounds, and any weight suspended from it shall be subtracted from the capacity of the aerial.

PAINTING

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

All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure finish paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly. Both aluminum and steel surfaces to be painted shall be primed with a two (2) component primer which is compatible with the finish coat. The apparatus shall be finish painted with a polyurethane base/clear system.

Utilizing the stainless-steel body fabrication, the interior of all compartments, inside hose bed, and surrounding areas adjacent to compartments doors shall remain a #4 brushed stainless steel finish. This practice shall eliminate the possibility of paint chipping, and electrolysis of aluminum, which can cause corrosive action between dissimilar metals. The chassis, compartment doors, front and rear jack panels, and rear fender panels shall be painted the color indicated.

Prior to reassembly and re-installation of lights, handrails, door hardware and any miscellaneous items, an isolation tape or gasket material shall be used to prevent damage to the finish painted surfaces. A nylon washer shall be installed under each acorn nut or metal screw that is fastened directly to a painted surface.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

PAINT TWO TONE CAB

The cab exterior surfaces shall be two (2) colors.

CAB PAINT BREAK LOCATION

The paint break line shall be at the bottom of the windshield.

PAINTED FRAME AND LOWER AERIAL COMPONENTS

The frame rails, rear drop, fuel beam, outriggers, sway bars, and lower aerial components shall be painted.

TURNTABLE PAINT

The turntable, side plates and lift cylinders shall be painted to match body color.

LETTERING

Forty (40) 6" “Engine Turn” Gold laminate gold leaf letters, with left hand shading and right hand outline to equal 6- 5/8" letter, shall be provided.

40 additional 6" letters shall be provided.

EMBLEMS

The fire department emblems shall be provided on the cab doors in “Engine Turn” Gold laminate.

KEEP BACK SIGN

A "Keep Back 500 Feet" sign of “Engine Turn” gold laminate shall be provided, affixed to the rear of the apparatus.

STRIPING

A 6" Scotchlite stripe shall be provided across the front of the cab and along each side of the apparatus.

“Z” STRIPE

The Scotchlite stripe shall be a one-piece "Z" type on the cab sides and continuing straight along each side of the apparatus.

CHEVRON STRIPING, LADDER CHUTE DOOR, ORAFOL REFLEXITE

The ladder chute door shall have 6” red and yellow reflective Reflexite Chevron style striping affixed to it. 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.

CHEVRON STRIPING, REAR BODY OUTBOARD, ORAFOL REFLEXITE

The apparatus shall have 6” red and yellow reflective Orafol Reflexite Chevron style striping affixed to the outboard rear body panels. 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.

CHEVRON STRIPING, FRONT BUMPER, ORAFOL REFLEXITE

The apparatus shall have 6” red and yellow reflective Orafol Reflexite Chevron style striping affixed to the front bumper. The striping will be set in a manner to have the effect of an inverted “V” shape.

BOOM SIGN

A boom sign, approximately 87" x 10", shall be provided on each side of the boom. The background of the boom sign shall be painted primary truck color.

BOOM SIGN LETTERING

Up to twenty (20) 8" “Engine Turn” Gold laminated gold leaf letters, with left hand shading and right hand outline to equal 8-5/8" letter, shall be provided on each boom sign.

MISCELLANEOUS EQUIPMENT FURNISHED

1 pt. touch-up paint

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 shall be provided. The wheel chocks shall be located in an area close to the rear axles easily accessible from the side of the apparatus.

- Or equivalent meeting current minimum NFPA Fire Apparatus Standards and/or current DOT Regulations.
- Or equivalent to the above listed options.

PIKE POLE STORAGE

Storage tubes shall be recessed each side of the rear compartment for pike pole storage. A spring- loaded clip shall be installed near each tube to secure the head of a standard pike pole.

OPERATION AND SERVICE MANUALS

Complete "Operation and Service" manuals shall be supplied with the completed apparatus, one (1) printed copy and one (1) USB flash drive. Service manual instructions shall include service, maintenance and troubleshooting for major and minor components of the truck. The apparatus manufacturer shall 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 shall be included.

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

WARRANTIES

The following warranties shall be supplied. See warranty documents for complete coverage details of each warranty provided.
The apparatus shall be warranted to be free from mechanical defects in workmanship for a period of one (1) year. The apparatus shall be covered for parts and labor costs associated with repairs for a period one (1) year.

Life-time warranty on the frame.

Ten (10) year cab structural warranty. Ten (10) body structural warranty.
Ten (10) year warranty on paint.

Two (2) year aerial mechanical warranty. Thirty (30) year aerial structural warranty.
The OEM warranties shall be applied for all major components.

MANUFACTURING & LOCATIONS

The apparatus will be manufactured in facilities wholly owned and operated by the company. A complete stock of service parts, and service shall be provided on 24 hours around the clock basis. The company shall maintain parts and service for a minimum period of twenty (20) years on each apparatus model manufactured.
Minimum 75 years of manufacturing experience.

- **NO EXCEPTIONS**

FIRST CHASSIS TORQUE

The dealer shall torque lug nuts and suspension holders to confirm proper torque prior to delivery.

TRAVEL

The dealer shall cover the cost of meals, lodging and basic ground travel for KFD personnel in the following configuration Preconstruction- 5 KFD personnel, Mid inspection- 2 KFD personnel, Final inspection- 5 KFD Personnel.

CONTINGENCY FUND

The dealer shall supply a contingency fund for equipment mounting in the amount of 30,000.00.

EQUIPMENT FUND

A fund shall be established for the purchasing of equipment to outfit this apparatus. The total for that fund shall be $100,000.00.

REQUEST FOR PROPOSAL
CITY OF KENOSHA
KENOSHA FIRE DEPARTMENT
ONE (1) NEW AERIAL LADDER FIRE RESCUE UNIT
PROPOSAL NOTICE #04-23

City of Kenosha
Municipal Office Building
625 52 nd Street, Room 208
Kenosha, WI. 53140

We hereby propose to provide and deliver F.O.B. Destination, to City of Kenosha, Station 4 Maintenance Garage, 4810 60th Street, Kenosha, WI. 53142, the equipment specified in this document at the following firm price:

Manufacturer/ Model/ Model Year: _____

Total Cost: $ _____

Estimated Delivery time: _____ Days from receipt of the purchase order. Manufacturers Literature Included Yes_____ No_____

Specifications Sheets Completed and Submitted Yes_____ No_____

Warranty: (Please be Specific)

_____

_____

_____

Service Facility: _____

Company Name: _____

Address: _____

Contact Name: _____

Telephone: _____ FAX: _____

E-mail: _____

Payment terms _____%, _____days, Net _____days

Respectfully submitted by

Firm: _____

Signature: _____

Print Name: _____

Address: _____

Telephone: _____ FAX: _____

E-mail: _____

Date: _____