

CITY of FITCHBURG FIRE DEPARTMENT

5791 West Lacy Road Fitchburg, WI 53711

SPECIFICATION FOR A MOBILE WATER SUPPLY FIRE APPARATUS

1.0 INTRODUCTION

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1.1 GENERAL INFORMATION

It is the intent of this specification to provide a working guideline for the construction and delivery of a complete apparatus equipped to meet the needs of the City of Fitchburg Fire Department (“Department”). This specification covers the general requirements as to the type of construction along with certain details as to finish, equipment and appliances and the tests which the apparatus must meet. Any minor details of construction and material where not otherwise specified are left to the discretion of the manufacturer (“Contractor”), who shall be solely responsible for design, construction, and compliance of all features.

The National Fire Protection Association (NFPA) Standard 1901 (2003 edition) for Automotive Fire Apparatus, unless otherwise specified in these specifications, shall prevail. Bidder shall advise the Department of any areas where this specification conflicts with NFPA 1901 to create a non-compliant situation.

The City of Fitchburg (“City”) reserves the right to accept the proposal which in its opinion best meets Department’s needs and the requirements outlined in this specification. All contractors will accept the judgment of the City of Fitchburg without prejudice or recourse.

Deviations, hidden or otherwise not detected at the time of delivery, found and brought to the attention of the Contractor within the first two (2) years shall be the responsibility of the Contractor to correct, upgrade, or modify to meet the specification at no cost to the City unless other agreements or arrangements are made with the City regarding the specific deviation.

1.2 CONTRACTOR REQUIREMENTS

Proposals will only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in continuous operation as a fire apparatus manufacturing entity for not less than the five years leading up to the release of this specification. Further, the Contractor’s primary business shall be the construction of fire apparatus, as defined as more than 50% of gross annual revenue and number of vehicles produced. The Contractor shall either submit such evidence or be prepared to do so at the request of the Department.

Each contractor shall furnish satisfactory evidence of the company's ability to construct the apparatus as specified. References for customers who have taken delivery of similar apparatus should be provided as evidence of the company's ability to build and deliver such apparatus. The City reserves the right to request a performance bond from a contractor but primary pricing proposals shall not include the cost of such a bond (see Section 12.5 for additional details).

The vehicle's body must be constructed and mated with the chassis at a facility located in the state of Wisconsin or an immediately adjacent state (Minnesota, Illinois, Iowa or Michigan). Contractor shall specify the location of the factory where the apparatus is to be built.

Contractor shall include in their bid the location of service center(s) where warranty work, maintenance and repairs for the chassis, body and sub-components can be obtained. Contractor shall also outline the responsible parties and processes needed to obtain warranty, service and repair work.

1.3 PROPOSAL REQUIREMENTS



Proposals and pricing must remain firm for a period of ninety (90) days from date of bid opening.

A drawing of the proposed vehicle shall be included with the proposal.

1.4 INSPECTIONS



The City reserves the right to inspect the project at any time during normal business hours. The Contractor shall notify the City at least five (5) days prior to the following times during the project to permit inspection by the Department truck committee:

1. At completion or delivery of the cab/chassis assembly,
2. At completion of body assembly, just prior to finish paint, and
3. Just prior to the completed apparatus being delivered to the Department but after the successful completion of all performance tests.

The Contractor shall provide reasonable travel arrangements and accommodations for not less than three members of the Department truck committee on each of the inspection trips specified above. Any additional trips or members shall be at the expense of the Department.

1.5 PERFORMANCE REQUIREMENTS and TESTING



The completed vehicle shall undergo road and service testing as specified within NFPA 1901.

The apparatus shall also meet or exceed the following additional performance requirements:

1. The fully loaded apparatus shall be run ten (10) miles or more in a single session. During the test the apparatus shall show no loss of power or overheating. The transmission drive shaft and rear axle shall run quietly and be free from abnormal vibration or noise through the operating range of the apparatus.
2. The rear axle gear ratio shall be designed to achieve a maximum road speed of 75 mph at the engine manufacturer's recommended maximum engine speed.
3. The apparatus shall be tested and approved by the Underwriters Laboratories, Inc. in accordance with their standard practices for pumping engines.
4. The vehicle shall operate in an ambient air temperature range from -30°F to +110°F.

The Contractor shall furnish a weight certificate showing weights on front axle, rear axle and total weight for the completed apparatus at the time of delivery.

The Contractor shall furnish at the time of delivery copies of the Pump Manufacturer's Certification of Hydrostatic Test, the Engine Manufacturer's current Certified Brake Horsepower Curve, the Manufacturer's Record of Pumper Construction Details, and the Underwriters Laboratories pump test certificate.

1.6 FAILURE TO MEET TEST



In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the Contractor within thirty (30) days of the date of the first series of tests. The second trial will be final and shall be cause for rejection.

1.7 WARRANTY



The following warranty is to be furnished with each contractor's proposal and printed on a company form.

Warranty: We warrant each new piece of Fire and Rescue Apparatus to be free from defects in materials and workmanship under normal use and service. Our obligation under that warranty is limited to repairing or replacing, as the company may elect, any part or parts thereof which shall be returned to us and as to which examination shall disclose to the company's satisfaction to have been defective, provided that such part, or parts shall be returned to us not later than one year after the delivery of such vehicle. Such defective part or parts will be returned or replaced free of charge including transportation charges prepaid by the company and without charge for disassembly to gain access to the defective part or parts or installation to the original

purchaser.

This warranty will not apply:

1. To normal maintenance services or adjustments.
2. To associated equipment furnished with chassis, signaling devices, generators, batteries, or other trade accessories as they are usually warranted separately by their respective manufacturers.

This warranty is in lieu of all other warranties, expressed or implied, all other representations as to the original purchaser and all other obligations or liabilities, including liability for incidental or consequential damage on the part of the company. We neither assume any other warranty or liability on the company's behalf unless made or assumed in writing by the company.

1.8 LIABILITY



The successful contractor shall defend any and all suits and assume all liability for the use of any patented process, device or article forming a part of the apparatus or any appliance furnished under contract.

1.9 EXCEPTIONS TO SPECIFICATION



The Contractor shall strictly adhere to the specification. Exceptions will be considered only if it is demonstrated, by calculation or documented field experience, that they are equal or superior to that which is specified. Exceptions must be listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS". Exception list shall refer to specification page and section number.

Any details of the specification for which an exception has not been taken by the Contractor will be assumed by the City to be included. Wherever the Contractor's proposal and the City's specifications conflict, the City's specifications will prevail.

Apparatus will be inspected upon delivery for compliance with the accepted proposal and approved engineering change orders. Deviations may not be tolerated and may, at the discretion of the fire chief, be cause for rejection of apparatus unless they were originally listed in the Contractor's proposal.

The Contractor's proposal and the City's specifications shall both be included as attachments to any contract entered into by the City. Any such contract shall include an order of precedence listing the contract, the City's specifications and the Contractor's proposal in that order, and clearly state that *unless specifically spelled out in this contract, any conflict between the contract, the City's specifications, and the Contractor's proposal, the City's specifications will prevail.*

1.10 DELIVERY

Delivery of the apparatus shall be taken by the Department at the Contractor's factory. The Contractor shall make available an individual or individuals qualified to demonstrate the proper operation of all components of the vehicle. The topics to be reviewed include any aspect of the proper operation, care and maintenance of the equipment as delivered. Not less than four hours of time shall be made available for the training of Department personnel.

1.11 DELIVERY TIME and PAYMENT PLANS

The proposal shall include an accurate statement of delivery time in calendar days after receipt of order.

The proposal shall state the total cost of the apparatus freight on board (F.O.B.) factory, and the payment plan required by the Contractor. The payment plan shall take into consideration that the City shall retain 10% of the total cost of the vehicle until thirty (30) days after the vehicle has been delivered, tested and accepted by the Department.

The Contractor shall list separately any discount available to the City should the City choose to prepay 90% of the proposal price at the time of contract signing. Under no circumstances shall the Contractor include this discount in the proposal price.

The Contractor accepts the City's payment process without penalty to the City, and understands all payments by the City required at any point in the project must follow standard City payment processes that include, but are not limited to, processing of a payment request by the Department, inclusion of the payment request in the City Finance Committee agenda by noon on the Thursday prior to the next meeting, approval by the Finance Committee at a committee meeting on the 2nd or 4th Tuesday of any given month, the possibility based on the size of the payment that full Council approval may also be required at the next regularly scheduled Council meeting on the 2nd or 4th Tuesday of any given month, and processing of a payment by the City Finance Department within 5 business days following necessary approvals. Every attempt will be made by the City and Department to process payments as quickly as possible within standard City payment processes.

1.12 INFORMATION REQUIRED

The Contractor shall supply at the time of delivery at least two copies of the following:

1. Complete operation and maintenance manuals covering the apparatus as delivered including maintenance schedules,
2. Complete parts lists, and

3. Any operations and services manuals for major components (engine, transmission, pump, etc.) or accessories provided by the respective manufacturer shall also be included.

1.13 APPROVAL DRAWING ☐ ☐ ☐

A blueprint must be approved by the fire chief or his designee prior to any metal being sheared or cut for the vehicle. The Department, the dealer and the apparatus manufacturer shall each have a copy of this blueprint. This blueprint shall then become a part of the total contract.

The drawing must show, but shall not be limited to such items as the chassis, all compartment locations and dimensions, pump panel layout (if feasible), discharges, lights, sirens, and etc. In actuality, this blueprint is to be a visual interpretation of the vehicle as it will be supplied.

1.14 GENERAL DESIGN CRITERIA ☐ ☐ ☐

The apparatus shall be designed and the equipment mounted with due consideration to the distribution of load between the front and rear axles, so that all specified equipment, a filled water tank, and a full complement of personnel will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chiefs and the National Fire Protection Association.

CRITICAL DESIGN REQUIREMENT: Because of space limitations in the Department's fire stations, the **MAXIMUM OVERALL VEHICLE LENGTH**, including any elements overhanging or otherwise protruding beyond the front and rear bumpers, shall not exceed **twenty-four feet, nine inches (24' 9")**. **NO EXCEPTIONS.**

1.15 QUALITY and WORKMANSHIP ☐ ☐ ☐

The design of the apparatus must embody the latest approved automotive engineering practices. The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points:

1. Accessibility of the various units which require periodic maintenance,
2. Ease of operation (including both pumping and driving), and
3. Symmetry and proportion.

Construction must be rugged. Ample safety factors must be included such that the vehicle is able to safely and reliably meet the criteria set forth in the "Performance Requirements and Testing" section.

Welding shall not be employed anywhere that it will prevent the ready removal of any

component part for service or repair. Panels for accessing the medium pressure auxiliary pump shall be designed for easy removal with a minimum of tools.

2.0 CHASSIS **Y N E**

2.1 GENERAL REQUIREMENTS

The chassis shall be a Kenworth model T300 class 7 truck chassis with a *single rear axle*. There will be **NO EXCEPTIONS** allowed to this requirement as the Department is standardizing on this chassis for certain types of apparatus. The chassis shall be delivered to the Contractor painted in white (see Section 10.2)

2.2 AXLES

The vehicle axles shall be of a sufficient rated weight capacity to exceed the anticipated gross vehicle weight including water, personnel and equipment.

The front axle shall have a turning angle of forty–five degrees (45°) or greater. Front axle shall include oil seals with viewing window.

The rear axle gear ratio shall be designed to achieve a maximum road speed of 75 mph at the engine manufacturer's recommended maximum engine speed.

2.3 SUSPENSION

Front springs shall be constant rate type. Heavy duty telescoping shock absorbers shall be provided.

Spring hangers shall have provision for lubrication. All grease fittings shall be of a type for ease of service from under the vehicle. Front and rear springs (main and auxiliary) shall be rated to exceed the anticipated loads of the vehicle.

The angle of approach and departure shall be maximized as much as practical but not less than the eight (8°) degree minimum specified in NFPA 1901. Preliminary drawings shall include estimated angles of approach and departure.

2.4 WHEELS and TIRES

Wheels shall be polished aluminum hub–piloted Budd–type. Tires shall be Michelin brand; **NO EXCEPTIONS**. Michelin XZA1, or equal, radial tires shall be furnished for the steering tires. Michelin XDN2, or equal, radial tires shall be furnished for the drive tires. Each load bearing tire and rim shall carry a weight not to exceed ninety (90%) percent of the recommended load when apparatus is loaded as indicated in NFPA 1901–12.1. Compliance shall be determined by weighing the load supported by the tires. Front and rear mud flaps, black in color, shall be provided.

2.5 STEERING



Power steering shall be provided. A padded steering wheel with tilt and a telescoping column shall be provided. The Contractor shall state the maximum left and right cramping angles in the proposal.

2.6 BRAKES and AIR SYSTEM



The brake system shall be a full air-type controlled by an anti-lock braking system (ABS). Brakes shall be ventilated disc rotor-type, with automatic slack adjusters. The system shall meet or exceed current FMVSS-121 requirements. Other components or accessories shall be as follows:

1. Air compressor shall produce a minimum of 16.1 cfm,
2. A quick buildup section in the air reservoir system shall be arranged so that the apparatus is able to move within 60 seconds of start-up with a completely discharged air system,
3. Bendix-Westinghouse (or equal) dual brake treadle valve,
4. Three (3) air reservoirs (tire-style air chuck to be provided on main tank),
5. Bendix-Westinghouse model AD-SP air dryer with heated automatic moisture ejector with sufficient capacity for the air system,
6. Two (2) air gauges on cab dash with indicator lights and buzzer,
7. Nylon brake lines wrapped in loom.

The anchorlock parking brake system shall be a spring set type that operates in the event that the rear brake system loses air pressure.

3.0 POWERTRAIN



3.1 ENGINE



The vehicle shall be powered by a Caterpillar or Cummins engine and have sufficient torque and horsepower to meet the vehicle performance requirements. Engines from other manufacturers are not acceptable.

The following fluid checks and fills shall be clearly marked:

1. Engine oil,
2. Transmission oil,
3. Engine coolant,
4. Power steering fluid,
5. Windshield washer fluid, and
6. Any other fluids necessary for the safe operation of the vehicle and its fixed systems.

The Contractor shall take all necessary steps to minimize engine noise to meet the requirements as outlined within NFPA 1500.

3.2 COOLING SYSTEM

A radiator matched to the designed cooling needs of the engine shall be provided. Drain cock(s) shall be located at the lowest point(s).

A heavy-duty automatic fan shall be provided.

The cooling system shall have an expansion tank. The expansion tank shall be installed in a location easily accessible for checking the fluid level and adding additional coolant. Total cooling system capacity shall be listed within the proposal.

The cooling system shall include a filtering system with spin on filter(s).

3.3 FUEL SYSTEM

A fuel tank of at least fifty (50) gallon capacity shall be provided. It is to be equipped with swash partition(s) and venting. The fueling point shall be marked with an engraved label stating "Diesel Fuel Only".

3.4 TRANSMISSION

An Allison 5-speed torque converting automatic transmission matched to engine load requirements shall be provided. Shift module shall be mounted to the right of driver. Shift position indicator to be illuminated for after-dark operation. A transmission temperature gauge with red warning light and buzzer shall be installed in cab dash.

Two (2) 10-bolt PTO pads shall be provided on the transmission.

Transmission oil cooler shall be provided in the lower tank of the radiator.

3.5 EXHAUST

A single engine exhaust pipe with muffler shall be routed to discharge along the curb of the vehicle. The exhaust pipe discharge shall be angled to prevent exhaust fumes from staining or discoloring the chassis or body in any way over time.

The exhaust system shall meet all currently applicable DOT noise restrictions and emissions restrictions and requirements.

3.6 ENGINE RETARDER

A Jacobs-brand (or equal) engine retarder of a type appropriate for the vehicle's engine and transmission combination shall be installed if the gross vehicle weight exceeds 31,000 lbs as per NFPA 1901. If available, high-low or high-medium-low settings shall be provided.

3.7 FLUID SPECIFICATION PLATE



The Contractor shall provide a fluid specification plate mounted in the cab in a readily visible location as per NFPA 1901-12.2.3.3. The fluids listed on this plate shall include all of those fluids listed in NFPA 1901-12.2.3.3 and Section 3.1 of this specification.

4.0 APPARATUS CAB



4.1 GENERAL REQUIREMENTS



A standard Kenworth model T-300 two (2)-door cab shall be provided. The color of interior metal surfaces and trim shall be gray

4.2 SEATING



Seats, Inc. 911 "Universal" 4-way air suspended seat shall be provided in the cab for the driver and passenger. Both seats shall be high backed and have padded headrests. Each seat shall have retractable 3-point lap & shoulder harness seat belts. The vertical movement of the seats shall be restricted, as necessary, to meet NFPA requirements.

Material shall be gray leather or heavy-duty vinyl. Cloth is not acceptable.

4.3 INTERIOR LIGHTING



A white courtesy step light or lights shall be furnished and located at each cab door. Automatic door switches shall control the lights.

White dome lights shall be provided above each riding position. Automatic door switches shall control the lights. A separate switch located on or adjacent to the light and accessible when an occupant is seated and belted shall also activate each white dome light.

Red dome lights shall be provided above each riding position. A separate switch located on or adjacent to the light and accessible when an occupant is seated and belted shall activate each red dome light.

OPTION: The white and red dome lights may be combined into a single unit. Both lights shall operate as outlined above and be switched separately.

One (1) low profile, red rotating warning light (**NO EXCEPTIONS**) shall be installed inside the cab at eye level for the driver; the exact location to be determined during the pre-construction meeting. This light and an associated warning buzzer shall be

activated whenever the parking brake is disengaged and any cab or compartment door is open, either portable water tank bracket is not properly stowed and latched, or any water tank dump chute is not properly stowed.

A momentary cut-out switch shall be provided and installed in the cab's switch panel. This switch shall disable the warning light and buzzer until either the parking brake is set or a second monitoring point is activated (i.e. another door is opened or a dump chute extended).

4.4 SOUND PROTECTION



The Contractor shall take all necessary steps to minimize engine and road noise within the vehicle cab. The current edition NFPA Standard 1500 Firefighter Safety and Health Program shall be used as the design criteria for noise levels within cab positions. The Contractor shall state in the bid exception sheet what noise reduction methods will be used and the projected noise levels. Actual noise level measurements and a written statement of compliance with NFPA 1500 shall be provided prior to delivery of the vehicle.

4.5 ADDITIONAL CAB INTERIOR STORAGE



A map book storage rack shall be provided. It shall be located on the floor between the driver and passenger seats such that either occupant can retrieve the contents while seated and belted. The rack shall be capable of holding three (3), three inch (3") three-ring binders. The Contractor and the Department truck committee shall agree upon the exact design and location prior to installation.

4.6 DASH, INSTRUMENTATION and CONTROLS



Cab instruments and controls shall be located on the cab dashboard. All gauges shall be plug-in type, and therefore, easily removed. The following gauges and controls shall be furnished:

1. Speedometer/odometer
2. Electric tachometer
3. Engine hourmeter,
4. Engine oil pressure gauge with red warning light and audible alarm,
5. Engine temperature gauge with red warning light and audible alarm,
6. Air pressure gauges, front and rear air systems, with red warning light and audible alarm,
7. Automatic transmission oil temperature gauge with red warning light and audible alarm,
8. Voltmeter with red warning light and audible alarm,
9. Fuel gauge,
10. Four position keyless ignition switch,

- 11. High idle control,
- 12. Headlight and self-canceling turn signal switches,
- 13. Windshield wiper and washer controls,
- 14. Battery "on" indicator light on dashboard,
- 15. Parking brake "on" red indicator light on dashboard,
- 16. Air cleaner restriction indicator,
- 17. Horn button at center of steering wheel for dual electric horns,
- 18. Other gauges and controls as required; these shall be specified in the Contractor's proposal.

All audible alarms indicating vehicle problems (i.e. engine alarms) shall have a secondary alarm device audible outside the vehicle when the vehicle is running at load (i.e. PTO pump is engaged) or high idle.

To the greatest extent possible, all switch and control locations and labels shall match those of the Department's existing Kenworth. This is to create as standardized of a driver's compartment as possible.

Dash controls and switches shall be identified as to function by imprinted words adjacent to item. Actuation of headlight switch shall illuminate all words using a backlighting method for after-dark operation. Turn signal and high beam headlight indicators shall be provided.

Emergency light switch panel shall have a master switch that activates a sequential lighting system for the emergency lights plus individual switches for selective control. Switches shall be rocker-type with integral indicator light.

A placard indicating the overall vehicle height and weight shall be mounted such that it is clearly visible to the driver when seated.

4.7 ENVIRONMENTAL CONTROLS and FEATURES



A fresh air heater/defroster/air conditioner with temperature control to be provided. Vents shall be arranged to distribute air throughout all parts of the cab and crew compartment. The environmental controls shall be capable of maintaining an average cab interior temperature of 65°F in winter and 75°F in summer assuming an ambient air temperature range of -30°F to +110°F.

4.8 MIRRORS



Dual Kenworth Aero Motor (Kenworth data code #8865000) remote control mirrors with integral heated convex mirror shall be provided along with all other necessary components (which may include data codes #8850210, #8850300 and #8869006).

4.9 CAB EXTERIOR

Hand grab rails of anti-slip design and meeting NFPA 1901 requirements shall be provided at all doors to assist with entering and exiting the cab.

Two tow hooks shall be installed and attached to the front frame members.

5.0 MEDIUM PRESSURE AUXILIARY PUMP

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5.1 GENERAL REQUIREMENTS

A Darley model HM-350 power-take-off (PTO) driven single stage centrifugal medium pressure auxiliary pump shall be provided and installed according to requirements of NFPA 1901-17. The pump shall be UL-rated and tested.

The pump and panel shall be located on the street side of the vehicle in the forward-most part of the body. The panel shall be enclosed in a compartment as specified in Section 6.4.1. The compartment shall have a roll up compartment door.

5.2 POWER TAKE-OFF

One (1) Chelsea-brand or equivalent power take-off (PTO) unit shall be supplied to connect and power the fire pump from the vehicle transmission. The PTO and pump shall have the capability to be operating while the vehicle is moving (“pump and roll”) slowly and the engine speed remains below 800 rpm. Provisions shall be made to disengage the PTO should the engine speed exceed 800 rpm.

The PTO shall be engaged with a switch located on a panel at the left knee of the driver as this location is consistent with the location of PTO switches on other Department vehicles.

The engine retarder, if installed, shall be disabled when the transmission is in pump gear as per NFPA 1901.

5.3 PRIMING PUMP

Primer shall be a Hale model ESP Environmentally Safe Priming system or equivalent system utilizing an oil-less primer pump.

Priming pump shall be electrically driven and actuated with single action control on pump operator’s panel. When operated, the control shall automatically open the priming valve and activate the primer motor at the same time, thus being a one hand operation. Primer valve shall be connected to the top of pump volute.

5.4 PUMP OPERATOR'S CONTROL PANEL



The pump panel shall be constructed of the same material as the body and covered with black matte vinyl. It shall be positioned as close to the compartment opening as practical while leaving room for the 2½" discharge specified in Section 5.7(1). The gauges and other controls shall be positioned on the panel so they are in view of a 6' firefighter standing within 18" of the compartment opening.

The following controls and gauges shall be provided:

1. One (1) Fire Research InControl model TGA200 series electronic pressure governor matched to interface with the vehicle engine. The "PRESET" shall be set to pump in pressure mode at 115 psi,
2. Three (3) 2½" discharge pressure gauges, 0-600 psi, silicone filled, one for each pump discharge, located in close proximity to the valve controls per NFPA 1901,
3. One (1) primer pump control valve,
4. One (1) water level indicator (if required),
5. One (1) set of UL test ports for pressure and vacuum,
6. One (1) valve for a ¾" pump by-pass cooler line,
7. One (1) booster hose reel rewind switch,
8. One (1) master drain control, and
9. Intake and discharge valve controls as in Sections 5.6 and 5.7.

Contractor shall list any additional controls that are deemed necessary for the proper and safe operation of the pump in the EXCEPTIONS TO SPECIFICATION list. All pump controls shall be color coded using a scheme specified by the fire chief or his designee.

5.5 PUMP PIPING



All intake and discharge lines shall be constructed of heavy duty, schedule 40 pipe, primed and painting to match the apparatus body. All piping attached to the water tank or expected to have standing water in it shall be type 304-L stainless steel or reinforced rubber hose. Only sweep-type elbows shall be used to minimize friction loss. Victaulic or rubber couplings shall be utilized where vibration or chassis flexing may cause damage or loosen piping. All water carrying gauge lines shall be of flexible polypropylene tubing to prevent breakage caused by vibration.

All 1" or larger in-line valves shall be full flow style and controlled by easy operating controls. As there are no discharges larger than 2½", slow opening/closing valves are not required. All controls will be designed and installed to permit easy operation of the valves without distortion. Valves shall include adjustment capability.

5.6 INTAKE SIDE



One (1) 4" tank to pump intake (supply) line shall supply the pump and be equipped with a 4" electric operated butterfly valve. The control for the valve shall allow only two positions: fully open or fully closed. Indicator lights shall be placed adjacent to the control switch showing the current position of the valve. If needed, a check valve shall be provided in the line to prevent the unintentional back-filling of the tank.

5.7 DISCHARGE SIDE



The following discharge lines shall be provided:

1. One (1) 2½" discharge located on the street side of the vehicle on the pump operator's panel. The discharge valve shall be a ¼-turn, full-flow, drop-out, self-locking type to allow gating of the discharge. The 2½" outlet shall be equipped with a chrome plated 2½" NST male, 30° droop snoot end, and a chrome cap and chain.
2. One (1) 1½" discharge supplying the booster hose reel in Compartment #2 (see Sections 5.8 and 6.4.2). The booster hose reel shall be plumbed with 1½" piping/high pressure hose and controlled with a 1½" valve. The control for the valve shall be located on the pump operator's panel.
3. One (1) 1½" discharge terminating at the forward end of Compartment #3 (see Section 6.4.3) with a 1½" NST male outlet. The outlet shall be positioned in the forward wall of the compartment such that a standard 1½" rocker lug hose coupling can be easily attached and tightened. The discharge valve shall be a ¼-turn, full-flow, drop-out, self-locking type to allow gating of the discharge. The control for the valve shall be located on the pump panel.

All discharge valves shall be installed behind the pump panel and shall be Akron Brass stainless steel heavy-duty swing-out valves.

Each discharge line shall be equipped with a ¼-turn or automatic drain valve to assure complete drainage of water from the piping. Cable actuated drain valves are not acceptable. The water is to drain below chassis.

5.8 BOOSTER REEL



One (1) Hannay "F" series aluminum booster hose reel with electric rewind shall be provided and installed in Compartment #2 (see Section 6.4.2). The booster reel shall be sized to hold and furnished with 100' of 1" rubber booster hose.

A polished stainless steel roller and spool assembly shall be provided to guide the hose off/onto the reel to minimize damage to the compartment doorway. The reel shall be equipped with a water-lubricated, self-flushing, bronze swivel joint, and adjustable brake for free wheeling/drag/full lock operation.

The rewind switch for the reel shall be located on the pump operator’s panel. The handle for manually rewinding the reel shall be provided and mounted in the compartment.

5.9 PUMP CIRCULATOR LINE

A 3/8” line shall be installed to provide auxiliary cooling for the pump. The line shall run from the top of the discharge of the pump, through a valve mounted on the pump operator’s panel, and discharging into the vehicle’s water tank fill tower.

6.0 APPARATUS BODY Y N E

6.1 GENERAL REQUIREMENTS

The Contractor shall construct either a wet-side or dry-side mobile water supply body. The choice of style is at the discretion of the Contractor but must be specified in the bid. Regardless of style proposed, the design shall *not* include a hose bed or other storage area located above the vehicle’s water tank. **NO EXCEPTIONS.** The exclusion of working or storage areas unreachable from the ground will minimize the need for stepping, standing and walking surfaces specified in NFPA 1901-15. The apparatus body and body sub-frame shall be constructed of the same material, either stainless steel or aluminum. Contractor shall state the specific thickness used for the various body construction components in the bid.

Contractor shall state the exact method of construction. The sides are not to form any part of the fender compartments. The body shall be mounted to withstand normal on and off road stresses, isolated to prevent electrolysis, jig assembled to assure square-ness, and securely bolted to the chassis frame.

Aluminum treadplate shall be Reynolds Aluminum polished "Treadbrite" or equal. Under no circumstance shall treadplate be installed in a vertical position except with *signature approval* by the Department truck committee. Such an installation is grounds for the rejection of the entire vehicle by the Department. **NO EXCEPTIONS.** For vertical surfaces where the Contractor might normally install treadplate, brushed finish metal should be substituted.

Contractor shall provide information concerning method(s) used for electrolysis isolation between dissimilar materials.

The rear fenders shall be integrated with the side compartments. The fender housing shall be equipped with a full circular inner liner. The inner liner shall be designed to prevent the accumulation of dirt, salt, etc. and to permit thorough cleaning without getting under the vehicle. Adequate tire chain clearance shall be provided in fender housing when the vehicle is fully loaded. Chrome plated or polished stainless steel

fender crowns shall be installed at wheel openings with rubber welting between the body and the crown.

A rear tow eye or tow eyes shall be provided and securely attached to the chassis frame.

6.2 COMPARTMENT CONSTRUCTION



Compartments shall be designed to minimize infiltration of dirt, water, and other debris. All compartment floors shall be of "sweep out" design. Seams shall be sealed using a pliable caulking compound. Each compartment shall be ventilated to the outside atmosphere through louvers. The ventilation points shall be protected in such a manner to prevent infiltration by water and road spray.

Each compartment shall be provided with green rigid matting that raises equipment off of the metal floor.

All screws and bolts that protrude into a compartment shall have an acorn nut.

Drip protection shall be provided over all door openings.

6.3 COMPARTMENT DOORS



Except as noted, compartment doors shall be Robinson-brand roll-up doors. The finish on the doors shall be natural aluminum.

The lower door edge opening of each compartment shall have brushed stainless steel or aluminum scuff plate, with a 1/2" lip over the outboard edge, to prevent chipping of paint. Ends are to be capped off in a sloping fashion.

6.4 BODY COMPARTMENTS



The Contractor shall provide a maximum amount of compartment space in the body area. The Contractor shall state *net* total compartment space provided, after deducting space required for roll-up door storage when the doors are in the open position, spring shackles, extrusions, electrical equipment, batteries, etc. The following is a general guideline for compartment location, door type and intended purpose/contents:

6.4.1 COMPARTMENT #1 – Street side, pump and operator's panel



The operator's panel for the PTO pump shall be located in the forward-most area of the street side of the body. This compartment shall be as tall as the adjacent compartment and only as wide as necessary to house the pump controls and other pump components. There shall be sufficient depth accessible through the door to

allow for the vertical mounting of a Streamlight model SL-40 LITEBOX on either for the forward or aft wall of the compartment. The area between the control panel and the door shall have a floor thus fully enclosing the operator's panel; extending the compartment floor behind the pump control panel is at the Contractor's discretion.

6.4.2 COMPARTMENT #2 – Street side, ahead of rear wheels



This compartment shall be as tall, wide and deep as practical. At a minimum, the compartment shall be large enough to house the hose reel specified in Section 5.8. Any additional usable storage space shall be specified in the bid. Drainage shall be provided to prevent the accumulation of water that may leak from the hose reel.

6.4.3 COMPARTMENT #3 – Street side, above rear wheels



This fully-enclosed compartment shall extend from the rear of Compartment #2 to the rear face of the body. A tray open on the top side is not acceptable. The compartment shall be large enough to store and readily deploy a preconnected hoseline consisting of one hundred feet (100') of 1¾" Hi-Combat hose equipped with an Akron style 1767 combination nozzle through an access door located on the rear face of the vehicle. This access door shall be a full-opening, hinged door with latch. The opening shall be large enough that the nozzle and hose can be easily deployed through it. Scuff plates shall be installed around the door opening to protect the painted surfaces from damage caused by the deployment of the hose.

Additional access into the compartment shall be provided through the street side of the compartment for loading the hose and connecting it to the preconnected discharge outlet at the front of the compartment. This access shall be through one or two (Contractor choice) bottom-hinged pan-style door(s) that extend the entire width/length of the compartment.

6.4.4 COMPARTMENT #4 – Curb side, ahead of rear wheels



This compartment shall be as tall, wide and deep as practical.

Contractor should include cost allowances in the bid for the creation of storage brackets for some equipment including, but not limited to, the vertical storage of two rolls of 1¾" hose (50' sections), one roll of 2½" hose (50' section) and one roll of 4" LDH hose (25' section).

6.4.5 COMPARTMENT #5 – Curb side, above the rear wheels



This fully-enclosed compartment shall extend the length of the vehicle; a tray open on the top is not acceptable. The compartment shall be large enough to store a ten foot (10') section of six-inch (6") flexible PVC suction hose with a 1½" to 6" threaded inline jet siphon adapter.

A full-opening, hinged door with latch shall be located on the rear face of the vehicle. The opening shall be sufficiently sized so that the suction hose can easily be loaded and removed. Scuff plates shall be installed around the door opening to protect the painted surfaces from damage caused by the deployment of the hose.

6.4.6 WHEEL WELL AREA COMPARTMENTS



A triangular shaped compartment shall be built in the forward portion of each wheel well. The compartment door shall be hinged along either the hypotenuse or vertical edge. Bumpers shall be installed to prevent the doors from scratching the surrounding surfaces when opened.

The each compartment shall be designed to be as large as is practical. The intention is to store a rolled up or folded 12' x 12' canvas tarp and a fire extinguisher (20lbs ABC dry chemical on one side, 2½ gallon pressurized water on the other).

6.5 PORTABLE WATER TANK BRACKETS



Two (2) manually operated, flip-down style portable water tank brackets shall be provided and installed on top of the body skirting, one on the street and one on the curb side of the body. Each bracket shall be sized to accommodate a single Husky Portable Containment 2100 gallon, aluminum frame single-fold portable water tank (model ALF-2100). The water tank, when folded is 11' 3" in length by 30" in height by 7" in depth with a shipping weight of 109 lbs.

The brackets shall either be constructed of the same material as the body or, if constructed of a dissimilar metal, be completely isolated from the body to prevent corrosion. They shall be held in the upright position by over-center toggle locking clamps with safety latches, one at each end of the assembly.

Wind deflectors shall be fabricated and installed at the front and rear of the portable tank brackets. A heavy duty black vinyl cover shall be installed on the outside of the wind deflectors. Reinforcing bars shall be installed on the top and bottom edges of the cover and running the entire length of the cover to provide additional durability and strength.

NFPA compliant non-slip safety grab handles shall be installed at each end of the brackets to facilitate the safe lowering and raising of the brackets.

A sensor shall be installed in an appropriate location on the bracket and will activate the red rotating warning light and warning buzzer in the cab if either bracket is not properly latched in the transport position when the parking brake is disengaged.

6.6 RUB RAIL and SCUFF PLATES



A stainless steel rub rail not less than 2” in height shall be installed along the bottom edge of the body on both the curb and street sides of the vehicle. The rub rail shall have tapered end caps at the front and rear of the body and at the wheel well openings. The rub rails shall be held away from the body with rubber spacers. The fasteners used to attach the rub rail to the body shall be isolated as necessary to prevent contact between dissimilar metals. The rub rails shall be easily removable should replacement be necessary.

Brushed stainless steel scuff plates shall protect the following areas:

1. Behind any steps located on painted surfaces,
2. The exterior vertical surfaces between adjacent roll-up compartment doors and equal in height to the door openings,
3. In any other areas to prevent chipping of the paint, at the sole discretion of the Department truck committee, upon inspection of the vehicle.

7.0 WATER TANK



7.1 GENERAL REQUIREMENTS



Contractor shall provide a UPF-brand high impact polypropylene water tank constructed to the standards set forth in Chapter 19 of NFPA 1901. **NO EXCEPTIONS.** The exact capacity of the tank is left to the discretion of the Contractor to allow for proper weight distribution but under no circumstances shall the tank be less than 1,800 US gallons nor more than 2,000 US gallons. Contractor shall clearly state in the bid the exact capacity of the tank being proposed.

7.2 TANK MOUNTING



The tank shall be mounted to the truck chassis using a body framework of the same metal utilized for the body construction. The tank and frame assembly shall be properly cushioned and isolated from one another and from the chassis. All components shall be securely fastened to one another to prevent undesirable movement and potential damage.

7.3 VENTING/OVERFLOW PIPING



The tank shall be vented as per NFPA 1901 but with not less than one (1) six-inch (6”) vent/overflow pipe. The overflow pipe shall discharge at a location that will not interfere with the water flow during dump operations and will minimize traction loss of the rear wheels.

7.4 REAR DUMPING ASSEMBLY



One electric-actuated stainless steel 10" Newton quick dump will be provided at the rear center of the water tank and be equipped with a 14" stainless steel flip chute. The rear dump manifold, fabricated from the same material as the tank, shall be sumped below the bottom edge of the tank to provide 100% of water usage and to enhance the flow of the water.

One (1) control switch that activates the dump valve shall be located on each side of the body between the rear wheels and the rear face of the vehicle. The exact location of this switch shall be determined at the preconstruction meeting. The mounting of the controls shall be of such a design as to prevent accidental activation.

7.5 SIDE DUMPING ASSEMBLIES



One (1) 10" air-operated butterfly side dump valve with actuator shall be provided and installed on each side of the vehicle to the rear of the rear wheels. The valves shall be bolted to sumped tank flanges which are fully welded on the interior and exterior of the tank. The flanges shall extend into the tank sufficiently to allow for structural gussets to be attached to the tank for additional support. The side dumps shall have automatic telescoping stainless steel extension chutes which extend beyond the body approximately twelve inches (12") when the valve is activated.

Each dump valve shall have two electric-over-air controls. One is to be located on the rear face of the vehicle adjacent to the side where the dump chute is located. The other is to be located in the apparatus cab within easy reach of a driver seated and wearing a seatbelt. The mounting of the controls shall be designed to prevent accidental activation. Individual flow controls shall be provided to adjust the speed at which the valve operates and the chute extends.

7.6 TANK REFILL



One (1) four-inch (4") stainless steel fill line shall be installed on the rear face of the vehicle. It shall be located to the curbside of the rear dump assembly and installed in the rear head at a thirty degree (30°) downward angle. The line shall be equipped with a 4" NPT female (rigid) x 4" NST male, 5" butterfly valve controlled with a hand wheel and an individual ¼-turn drain valve. One (1) 4" NST female x 4" Storz adaptor with cap and cable shall be provided.

7.7 WATER TANK LEVEL SENSOR and DISPLAYS



The tank shall be equipped with a chemically resistant PVC sensing probe with stainless steel sensing wires.

Three (3) Whelen Strip-Lite model PSTANK LED lights shall be provided to indicate the

water tank level. The four tank levels to be indicated as follows: GREEN = “full”, BLUE = “ $\frac{3}{4}$ ”, AMBER = “ $\frac{1}{2}$ ” and RED = “ $\frac{1}{4}$ ”. The red “ $\frac{1}{4}$ ” level light shall flash when the tank level drops below $\frac{1}{4}$ of the tank capacity. Each light will be installed in a vertical orientation. One shall be installed on the rear face of the vehicle and one on each side at the front edge of the body. The gauge lights shall be deactivated whenever the parking brake is released. Contractor shall warrant that the colors of the LEDs do not conflict with any applicable Federal DOT or Wisconsin DOT color restrictions.

A small, four LED water tank level light shall be provided in the cab of the vehicle and, if necessary, on the pump operator’s panel. These gauge lights shall remain on at all times. The LEDs in the cab shall be low intensity so as not to distract the driver or interfere with his vision while driving at night.

8.0	ELECTRICAL SYSTEMS	Y N E
8.1	GENERAL REQUIREMENTS	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

All electrical wiring shall be sized to carry 125% of circuit capacity and installed in accordance with SAE J551 to minimize electromagnetic interference/suppression. All electrical equipment shall be installed to conform to modern automotive practices and NFPA 1901. Wiring shall be imprinted with circuit function over the length of each conductor.

All wiring shall be protected by automatic reset circuit breakers. Each circuit shall be loaded with no more than 80% of the circuit breaker’s capacity. The voltage drop in all circuits measured from the power source to the end device shall not exceed five (5%) percent.

All exposed wiring installed by Contractor shall be run in loom or conduit, properly supported and attached to body members along the entire run. At any point where wire or loom must pass through metal, rubber grommets shall be installed to protect against abrasion.

Terminal or junction blocks shall be watertight, quarter turn aircraft type (or equal). Waterproof connectors shall be used on all exposed connections.

All solenoids, relays, terminal blocks and circuit breakers shall be located in an easily accessible compartment. The inside of compartment door shall have both a wiring layout printed on a metal plate and a complete index of wiring.

All electrical equipment switches shall be installed in switch panels in the cab dash and/or headliner. An emergency master switch shall control emergency lighting with a sequential switching device to minimize the electrical load on start-up, and individual switches to allow pre-selection of lights. All switches shall be rocker type

with integral indicator light to show when the circuit is energized. All light switches shall be mounted in a removable panel for ease in service.

All switches shall be clearly identified as to their function with the labeling being backlit for easy identification at night. To the greatest extent possible, the location and labeling of switches shall match those of the Department's current Kenworth chassis.

A body electrical system troubleshooting booklet is to be furnished with the apparatus. Booklet is to be complete with pictures of similar installation showing harness layouts, colors, numbers and sizes of all wiring used, pin location and function of wires.

An automatic electrical load management system shall be provided as outlined in NFPA 1901-13.3.6. The vehicle's headlights shall not be part of the load management system.

Any line voltage electrical system shall be tested at the system's continuous rated wattage for a minimum of two (2) hours. The Contractor shall provide documentation of the performance and results of the test(s).

8.2 CIRCUITS and BREAKERS



An adequate number of circuits for the required electrical loads shall be provided. Equipment shall be segmented into logical circuits or separated onto single circuits, if required. Three (3) spare 15A circuits with individual breakers shall be provided.

Circuit breakers for any warning equipment shall be a minimum of 20A.

8.3 BATTERIES, ALTERNATOR, STARTING and POWER SYSTEMS



Starting system shall use a minimum of two (2) 12V maintenance-free batteries with a cold cranking amps (CCA) rating that exceeds the minimum CCA recommendations of the engine manufacturer. Contractor shall increase the size or rating of the batteries as necessary to meet expected vehicle requirements.

The battery compartment shall be completely enclosed to minimize the infiltration of water and road grime. Adequate venting to the outside shall be provided. Batteries shall be mounted on a non-corrosive mat.

Heavy-duty battery cables shall be used to provide maximum power to the electrical system. Cables shall be color coded and run in automotive-type loom.

Alternator shall be heavy-duty type, with amperage rating adequate to handle

anticipated loads, and equipped with a heavy-duty regulator. Amperage output shall be adequate to operate all warning lights with engine at idle speed while maintaining minimum voltage of 13.8VDC. Contractor shall specify the anticipated load and provide verification that alternator proposed will deliver the needed amperage.

One (1) Kussmaul Electronics Auto Charge Pump Plus battery charger/conditioner with truck air system compressor shall be installed. The model charger selected shall have sufficient capacity to serve the electrical and air needs of the vehicle while parked with the engine shut down and connected to an 110VAC shoreline. The devices to be wired into the Kussmaul's battery saver circuit shall be determined at the pre-construction meeting. The Department truck committee shall approve the location of the remote display for the battery charger/conditioner.

8.4 NON-EMERGENCY VEHICLE LIGHTING



Exterior vehicle lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards, and the National Fire Protection Association requirements in effect at time of proposal. Whenever possible and practical, the lights shall be recessed to prevent damage. The use of LED-based lights shall be used whenever possible for non-emergency vehicle lights. The rear stop-tail lights shall be red Whelen model 700-series, or equivalent, LED lights. The directional lights shall be amber Whelen model 700-series, or equivalent, LED directional arrows. The backup lights shall be Whelen model 700-series halogen lights with clear lenses; **white LED lights are not acceptable**. The tail-stop, directional and backup lights shall be housed in a single polished housing.

8.5 PERIMETER LIGHTING



One (1) Federal Signal model GHSCENE FireRay area/perimeter light with vertical and horizontal adjustment shall be installed on each side of the cab directly to the rear of the cab doors to provide general area lighting.

Six (6) Weldon model 2025 lights with clear lens in waterproof mounts under the apparatus and facing outwards.

1. One (1) on each side of the cab, mounted under the cab step,
2. One (1) on each side of the body, centered under the compartments forward of the rear wheel, and
3. Two (2) evenly spaced under the rear bumper.

Lights shall be installed in an outwardly angle to provide ground illumination at least 3 feet from the vehicle. Lights shall be activated with the application of the parking brake, the opening of either cab door, or when the vehicle's transmission is placed in "REVERSE".

Four (4) Whelen model 90E000EB 8°–32° Opti-Scene lights:

1. One (1) light on each side of the vehicle, mounted as high as possible and located to provide illumination of the area for side water dumping operations and area lighting, and
2. Two (2) lights mounted high on the rear face of the vehicle to provide illumination of the area to the rear of the vehicle for rear water dumping, area lighting and vehicle backing operations.

Lights shall automatically activate with the deployment of the corresponding tank water dump valve/chute. The rearward facing lights shall also automatically activate when the vehicle transmission is placed in “REVERSE”.

Three switches shall be installed in the switch panel of the cab and shall allow a cab occupant to activate the Whelen and Federal Signal perimeter lights. The switches shall be arranged and labeled “LEFT SCENE”, “REAR SCENE” and “RIGHT SCENE” and shall activate the appropriate set of lights.

8.6 ADDITIONAL LIGHTING



Each compartment shall have at least one light for the purposes of illuminating the contents of the compartment. Additional lights shall be installed in larger compartments to ensure adequate illumination. A minimum of two lights shall be installed to illuminate the pump panel. The location of the lights shall be adjustable whenever possible. Automatic switches mounted on the door frames shall control the lights.

One (1) handheld spotlight with a minimum rating of 500,000 candlepower equipped with a momentary “on” switch and a mounting bracket shall be provided. The spotlight shall be wired for use with a standard 12VDC vehicle power point plug. The location for the bracket shall be determined at the pre-construction meeting.

A gooseneck-type map light shall be provided and mounted in front of the passenger seat. The light should be controlled by a switch at the base of the gooseneck and have an integral red lens that can be slide over the white bulb for nighttime use.

8.7 ADDITIONAL ELECTRICAL EQUIPMENT



The Contractor shall provide the following:

1. Wiring for one (1) Streamlight model SL-20XP rechargeable flashlight to be mounted on the back of the cab in a location to be determined by the Department truck committee,
2. Wiring for one (1) 12VDC portable radio battery charger to be mounted on the back of the cab at a location to be determined by the Department truck

committee,

3. Wiring for one (1) Streamlight model SL-40 LITEBOX rechargeable lantern to be mounted in a body compartment at a location to be determined by the Department truck committee,
4. Two (2) power point (“cigarette lighter”) plugs in a location to be approved by the Department truck committee, and
5. One (1) electronic back-up alarm.

Any wiring that is not connected to a device at the factory shall be properly terminated for future use.

8.8 RADIOS



The Contractor shall provide an AM/FM radio with weather capability and speakers mounted in the cab.

The following radio antennas shall be provided and installed on the roof in locations approved by the Department truck committee prior to installation:

1. Two (2) Antenna Specialists NMO mount 1 / 4 wave VHF antennas, model ASPD-1410,
2. One (1) Antenna Specialists NMO mount 1 / 4 wave UHF antenna, model ASPD-1610, and
3. One (1) Antenna Specialists NMO mount 5 / 8 wave 800Mhz antenna, model ASP-1980.

Four (4) individually protected 12VDC, 15A circuits shall be provided in the cab for two-way radios. These circuits shall be activated by the battery master switch and not switched by any other means. The purchase and installation of the two-way radios is beyond the scope of this project.

9.0 VISUAL and AUDIBLE WARNING SYSTEMS



9.1 NFPA-COMPLIANT VISUAL WARNING LIGHT PACKAGE



The Contractor shall install an NFPA-compliant warning lighting package incorporating a 60” Public Safety Equipment Code 3° MX-7000 warning light bar, Public Safety Equipment Code 3° 790X (front and side) and Public Safety Equipment Code 3° 791X (rear) warning lights. The MX-7000 shall be mounted to the roof of the cab and contain the following components:

1. Upper Deck: Two (2) 50W rotators in each outboard module with each pair separated by a diamond mirror; red outboard lenses. Inboard lenses shall be clear.
2. Lower Deck: One (1) 50W intersection/pursuit light in each outboard module

along with two (2) forward-facing red LED flashers. Two (2) forward-facing red LED flashers in each inboard module. All lower deck lenses shall be clear.

9.2 ADDITIONAL WARNING LIGHTING



The following lighting shall be installed in addition to the NFPA-compliant lighting package:

1. One (1) 3M Opticom emitter mounted in the curbside inboard module of the upper deck of the MX-7000.
2. An alternating high beam headlight flashing system shall be installed into the high beam headlamp system that allows the high beams to flash alternatively from left to right. The completed system shall be capable of using the high beam switch to override the flashing system. With the system in operation, the low beam headlights shall remain illuminated at all times, regardless of the high beams flashing. The alternating flasher system shall be deactivated when the vehicle's parking brake is applied.
3. One (1) Public Safety Equipment Code 3 48", eight head LC-Stick "ARROWSTIK" directional light mounted high on the rear of the vehicle in a location approved by the fire truck committee. The Arrowstik shall be installed in a manner that allows easy access for maintenance. A Public Safety Equipment model ASDCH control unit shall be mounted at the bottom of the switch panel located between the instrument panel and the transmission control.

9.3 WARNING LIGHT SWITCHES



Emergency warning lights shall be operated by a single "EMERGENCY MASTER" switch with individual switches for logical groupings of lights (i.e. lightbar, front, sides, rear, etc.) to allow specific lights to be turned off if desired. All **white** warning lights including lightbar rotators, intersectors, headlight wigwags, and traffic pre-emptor, shall be wired to separate switches such that they may be turned off in certain weather conditions (i.e. snow and fog) without affecting the other warning lights.

9.4 AUDIBLE WARNING DEVICES



Emergency audible warning devices shall meet the requirements of NFPA 1901-13.9 and consist of one (1) Federal Signal model EQ2B siren with 200W speaker. A traditional round "Q" grill cover shall be flush mounted in the center of the front bumper. Floor mounted treadle switches at the driver and passenger positions shall control the siren. The "Emergency Master" switch shall control the Q2B-F siren relay. A control unit shall be provided in the vehicle cab in a location approved by the Department truck committee. If possible, the air horn feature of the EQ2B shall be activated by a lanyard installed in the cab's headliner between the driver and passenger seats for consistency with other Department vehicles.

10.0 MISCELLANEOUS EQUIPMENT and MOUNTING **Y N E**

10.1 GENERAL REQUIREMENTS

The Contractor shall include eight (8) hours of time in the bid for mounting equipment supplied by the Department. The Contractor shall also include an hourly rate for equipment mounting beyond the included 8 hours.

10.2 WHEEL CHOCKS

Two (2) NFPA 1901-compliant, collapsible Zico wheel chocks shall be provided and mounted externally on the driver's side of the vehicle in a location approved by the Department truck committee.

10.3 EXTERNAL EQUIPMENT BRACKETS

Contractor shall construct or otherwise provide vertical mounting brackets to be located one each side of the vehicle between the water tank and the portable water tank brackets. The brackets are intended for the storage of flat fire brooms and fire swatters (approximate thickness: 3”).

11.0 PAINT and FINISH **Y N E**

11.1 GENERAL REQUIREMENTS

To insure proper quality and finish of the completed vehicle, certain components must be mounted while unit is being assembled. Prior to prime and paint, and only after determining proper fit and checked for operation and tolerances, these must be removed. This shall include:

1. All roll-up compartment doors
2. All door hinges, handles, latches and hold open devices,
3. All aluminum treadplate and other brushed metal finished pieces including, but not limited to, running boards, kick & scuff plates, and fenders,
4. All grab handles and handrails,
5. All drip moldings,
6. Tools and other mounting brackets,
7. All cab trim strips,
8. Wheels, and
9. Any other unpainted or plated items.

In addition, all hinged doors shall be removed and painted separately. To insure proper paint and finish of completed unit, exceptions to the minimum requirements listed above shall not be tolerated.

All exposed metal (running boards, etc.) shall be examined to determine if sharp edges exist. All sharp edges shall be hand filed to help prevent injuries to

firefighters while cleaning vehicle.

11.2 PREPARATION, FINISH and PAINT



The Department's color scheme is a dark forest green (PPG # FBCH47687) body and lower cab with a white (PPG # FBCH8717) upper cab and hood. To ensure the overall quality of the finished paint colors, the chassis shall be delivered to the Contractor painted in the white. The Contractor shall provide a paint sample or samples to the Department truck committee to determine the closest match to existing vehicles prior to any paint being mixed or applied. In addition, the paint break lines shall match the existing Kenworth-based Department vehicle, Utility 1.

All exposed metal surfaces not chrome plated or polished shall be thoroughly cleaned and prepared as per paint manufacturer's specifications so as to provide maximum corrosion protection and insure proper bonding of primer to metal surface. All irregularities in painted surface shall be rubbed down before the application of the finish coats. After all seams have been caulked, a finish coat of paint shall be applied to all surfaces excluding the wheels: dark forest green for the lower cab, chassis and the entire body, white upper hood, cab and cab roof.

The underside of the vehicle, including the underside of the hood and fenders, and behind any grill surfaces shall be painted dark forest green.

11.3 SAFETY TRIM



In general, the safety trim striping consists of Scotchlite reflective tape applied in a 4" band flanked by two 1" bands, white/silver when applied to a green painted surface or a 4" green band with white/silver flanking bands when applied to an unpainted silver/gray surface. The striping shall be applied to the vehicle in a manner similar to that applied to other Department vehicles and meeting the requirements of NFPA 1901.

A small decal of the Department's emblem shall adorn each front door of the cab, cut into the striping to exactly match Fitchburg Utility 1. The decal will be supplied by the Department.

As much of the rear face of the body as is reasonable or practical shall be covered with a green and white "A" pattern (a.k.a. inverted "V") chevron. The striping material shall be six-inch (6") Scotchlite reflective tape. The chevron shall be designed to match that of Fitchburg Engines 1 and 2.

The cab paint break shall be left untrimmed. The Contractor shall properly prepare the paint break for the application of a gold swirl with black pin stripe decal but the creation and application of the decal shall be done by the Department's lettering contractor for consistency with other department vehicles.

The Contractor shall illustrate the proposed arrangement of striping on the diagrams submitted with the proposal.

11.4 LETTERING

The Department shall be responsible for all lettering of the vehicle after delivery from the factory. All costs for vehicle lettering normally included in pricing proposals shall be removed.

11.5 TOUCH UP PAINT

Two (2) quarts of touch up paint for each color used shall be supplied.

12.0 PROPOSAL OPTIONS

Y N E

12.1 GENERAL REQUIREMENTS

Contractor shall provide the following options as additions or alternatives to the main proposal. Contractor shall furnish all cost, design, and operational details related to the option, including drawings if the vehicle design is different from the main proposal.

12.2 EXTENDED WARRANTIES

Contractor shall provide a list of all available extended warranties for all vehicle components. The Contractor shall specify what items are covered, the length of the warranty, any exclusions, and the cost for the warranty. This includes, but is not limited to, the engine, transmission, and any fixed systems.

12.3 EQUIPMENT MOUNTING

The Contractor shall provide an hourly rate or estimated total cost for custom mounting loose equipment (hoses, fittings, etc.). These costs shall be outlined in the bid exception sheet.

12.4 PORTABLE WATER TANKS

The Contractor shall list the cost for providing two (2) Husky Portable Containment (model ALF-2100) 2100 gallon single-fold portable water tanks. These shall have aluminum frames and vinyl liners (22 oz sides, 28 oz floor). The vinyl color shall be green except for four translucent panels (to show water level), two on adjacent sides at opposing corners.

12.5 PERFORMANCE BOND

The Contractor shall provide the cost for furnishing a 100% Performance Bond within thirty (30) days after notification of award of contract. If required by the City, the

performance bond must be furnished by company who will build the apparatus.
Performance bonds by salespersons or agents of the Contractor are not acceptable.

12.6 AUTOMATIC CHASSIS LUBRICATION SYSTEM



The Contractor shall provide and install an automatic chassis lubrication system. This system shall maintain the proper amount of lubricant to all points of the chassis requiring lubrication including, but not limited to, spring pins, steering gear, etc.

The lubricant reservoir shall be located such that its level can be checked and replenished through an access panel that does not require the use of any tools to open. The approval drawing shall identify the Contractor's suggested location for the lubrication reservoir with the final location to be mutually agreed upon by the Contractor and the fire chief or his designee.

The Contractor shall state in their proposal which components will be lubricated by the system.

The Contractor shall state the type(s) of lubricant(s) consumed by the system and the estimated volume consumed on an annual basis. Any additional chassis greasing that is not done automatically and therefore must be done manually shall be specified by location and frequency.