

# FORMAL BID PACKET

## Fire Department

Pre-Bid Meeting  
August 27, 2007  
10:00 am

Fire Administration Offices  
117 N Church Street, Monroe, NC 28112

Opening on  
September 20, 2007  
2:00 PM

City of Monroe Operations Center  
2401 Walkup Avenue Monroe, North Carolina  
28110

# **SPECIFICATIONS FOR ENGINE 5 MONROE FIRE DEPARTMENT**

**Rev. 7/11/07**

## **INTENT OF SPECIFICATIONS**

It shall be the intent of these specifications to cover the furnishing and delivery of a complete apparatus equipped as here in after specified. These specifications shall cover only the general requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials, which are not otherwise specified, shall be left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. Apparatus proposed by the bidder shall meet the requirements of the National Fire Protection Association (NFPA) as stated in current Pamphlet 1901 for Engine/Pumpers. Loose equipment shall be provided only as stated in the following pages.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Further, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal.

Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that the company is in position to render prompt service and to furnish replacement parts for said apparatus.

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.

## **QUALITY AND WORKMANSHIP**

The design of the apparatus shall embody the latest approved automotive engineering practices. The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility of the various units which require periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry the loads specified and to meet both on and off road requirements and speed conditions as set forth under "Performance Tests and Requirements". Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair. All steel welding shall follow American Welding Society D1.1-96 recommendations for structural steel welding. All aluminum welding shall follow American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum. Flux core arc welding to use alloy rods, type 7000, American Welding Society standards A5.20-E70T1. The manufacturer shall be required to have an

American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

### **DELIVERY**

Apparatus, to insure proper break in of all components while still under warranty, shall be delivered under its own power - rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the equipment delivered.

### **INFORMATION REQUIRED**

The manufacturer shall supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

### **PERFORMANCE TESTS AND REQUIREMENTS**

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters:

- A) The apparatus, when fully equipped and loaded, shall have not less than 25% nor more than 50% of the weight on the front axle, and not less than 50% nor more than 75% on the rear axle. No axle shall exceed its rated capacity when fully loaded.
- B) The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.
- C) The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.
- D) The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

### **FAILURE TO MEET TEST**

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to

conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the purchaser during the above-specified period with the permission of the bidder shall not constitute acceptance.

### **LIABILITY**

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

### **SPECIFICATION BID REQUIREMENTS**

Bidders shall also indicate if their bid complies **on each item** (PARAGRAPH) specified. Exceptions shall be allowed if they are equal to or superior to that specified and provided they are listed and fully explained on a separate page.

**Proposals taking total exception to specifications shall not be acceptable.**

Also, bidders shall submit a detailed proposal. A letter only, even though written on a company letterhead, shall not be sufficient.

**Bid proposals shall be submitted in the same sequence as this specification for ease of evaluation, comparison and checking of compliance or in a fully tabbed and indexed format.**

**An exception to these requirements shall not be tolerated.**

### **EXCEPTIONS**

All exceptions shall be stated no matter how seemingly minor. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the bidder.

### **GENERAL CONSTRUCTION**

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

### **PUBLIC LIABILITY INSURANCE**

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of public liability insurance:

Products/Completed Operations Aggregate	\$2,000,000
Personal and Advertising Injury	\$1,000,000
Each Occurrence	\$1,000,000

Coverage shall be written on either a Commercial or Comprehensive General Liability form. The policy shall be written on an occurrence form and shall include Contractual

Liability coverage. The policy shall include owner as an additional insured as their interest may appear.

The required limits can be provided by one or more policies provided all other insurance requirements are met.

Coverage shall be provided by a carrier(s) rated "Excellent" by A.M. Best.

### **UMBRELLA LIABILITY INSURANCE**

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate:               \$25,000,000  
Each Occurrence:     \$25,000,000

The policy shall be written on an occurrence basis and at a minimum provide the same coverage's as Bidder's General Liability, Automobile Liability and Employer's Liability policies. Owner shall be included as an additional insured as their interest may appear.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverage's listed above along with its bid. The certificate shall be made out to the purchaser and be an original, no photocopies shall be accepted. The Certificate of Insurance shall provide that owner be given 30 days advance notice of cancellation, nonrenewal or material change in coverage.

### **ISO COMPLIANCE**

The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the "International Organization for Standardization (ISO)" specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid.

### **SINGLE SOURCE MANUFACTURER**

Bids shall only be accepted from a single source apparatus manufacturer. The definition of single source is a manufacturer that designs and manufactures their products using an integrated approach, including the chassis, cab, body and pump section being engineered and designed by the bidder. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The warranties relative to the chassis, body and pump section (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body, and chassis). The bidder shall provide evidence that they comply with this requirement.

## **DEALER OWNED OR AUTHORIZED SERVICE**

The bidder shall state the names, number, and locations of dealer owned or authorized mobile service centers.

## **APPROVAL DRAWING**

A drawing of the proposed apparatus shall be provided with the bid document. Followed by (after the bid is awarded) an engineered drawing that will be approved by Monroe Fire Department before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.

## **WARRANTY**

Each piece of new fire or rescue apparatus shall be warranted to be free from defects in materials or workmanship under normal use and service. Each manufacturer shall supply, as a part of their bid package, a copy of the warranty or warranties that they propose to provide, and in no case shall it be less than one (1) year on the entire apparatus.

All other warranties, as outlined in these specifications shall be provided in writing as a part of the bid package.

Failure to provide the warranties as outlined throughout these specifications shall be cause for rejection of the bid package.

## **CHASSIS**

Chassis provided shall be a new, tilt-type custom fire apparatus. The chassis shall be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required.

## **ROLL OVER PROTECTION**

An advanced side roll protection system will be provided. The system will be a supplemental restraint system designed for use with seat belts. The system will be designed for a fast or slow vehicle 90-degree roll to the side, where the vehicle comes to rest on its side. The system will consist of the following key components:

Side air bags will only be provided outboard of the driver and officer forward positions. The side air bag will be a tubular structure that extends diagonally across the width of the side window to help keep the occupant's head inside the vehicle and away from the window opening.

An integral suspension seat safety system will be installed on the driver's seat. When activated, this system will remove excess slack from the seat belt and retract the seat to its lowest travel position.

Seat belt pretensioners will be provided in the remaining seating positions. When activated, these pretensioners will remove excess slack from the seat belt.

Side wall impact-absorbing cushions will be provided outboard of the crew cab seating positions.

A Side Roll Sensor will be installed in the cab above the engine tunnel between the head liner and the cab roof skin. The sensor will analyze the vehicle's angle and rate of roll to activate the advanced occupant restraints 120ms before the cab reaches 60 degrees from vertical. In the event of a side roll, the sensor will activate the advanced occupant restraints. The sensor will not activate in the event of a frontal impact, side impact, or any other incidents not involving a vehicle side rollover. If more than eight protective devices are required, a slave side roll sensor will be provided with capacity for additional protective devices. The sensor(s) will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll event. A fault-indicating light will be provided on the vehicles instrument panel.

### **SEATING CAPACITY**

The seating capacity in the cab shall be five (5).

### **WHEELBASE**

The wheelbase of the vehicle shall be no greater than 220.00".

### **GVW RATING**

The gross vehicle weight rating shall be a minimum of 46,500 lbs. and shall be adequate for the weight of the apparatus and equipment.

### **FRAME**

The chassis frame shall be built with two (2) steel channels bolted with cross members. The frame rails shall be constructed of 120,000 psi yield strength heat treated .38" thick steel, with minimum 3.50" wide flanges x 12.5" tall.

### **FRAME RAIL WARRANTY**

The frame rails shall be guaranteed for the life of the vehicle against defects in design, material or workmanship, excluding accident or abuse. A copy of the fire apparatus manufacturer's warranty shall be included with the bid.

In addition, a full length main frame liner shall be provided. It also shall be heat treated steel.

### **FRONT AXLE**

The front axle shall be an ***Independent Front Suspension*** equal to 19,500 pounds or an axle of equal design and function.

The turning angle shall be a minimum of 45 degrees or more to the right and to the left.

A viewing window shall be provided on each side of the axle for checking the oil level.

#### **TURNING RADIUS REPORT**

Supplied with the bid, shall be a turning radius analysis of the vehicle being proposed. This analysis shall provide the inside turning radius, the outside turning radius, the curb to curb turning radius and the wall to wall turning radius.

#### **STEERING CRAMP ANGLE CERTIFICATION**

The fire apparatus manufacturer shall provide, at time of bid, a letter from an independent third party testing agency stating they approve the steering cramp angle.

#### **FRONT AXLE WARRANTY**

The front axle shall have a three (3) year parts and labor warranty, plus an additional two (2) years of parts only coverage. The axle manufacture shall also provide a one (1) year parts and labor warranty for wheel seals. The seal warranty shall apply to our standard manufacture wheel seals and shall not apply to another specified seal. If other seals are specified, the warranty shall be parts only.

#### **STEERING**

A Ross TAS-85 steering gear, with integral heavy-duty power steering, shall be provided. The power steering shall incorporate a Vickers V20NF hydraulic pump with integral pressure and flow control.

A letter from Vickers, stating they approve of the hydraulic pump selection, its operating temperature and flow, shall be furnished with the bidder's proposal.

The steering wheel shall be capable of tilting and telescoping.

The front axle shall be equipped with a Ross power assist cylinder, to aid in the steering of the apparatus.

#### **REAR AXLE**

The rear axle shall be an axle assembly with a capacity of 27,000 pounds or an axle of equal design.

#### **REAR AXLE WARRANTY**

The rear axle shall have three (3) year parts and labor warranty shall be provided with this axle, plus an additional two (2) years of parts only coverage. They shall also provide a one (1) year parts and labor warranty for wheel seals. The seal warranty



shall apply to the standard wheel seals and shall not apply to another specified seal. If other seals are specified, the warranty shall be parts only.

### **TOP SPEED OF VEHICLE**

A rear axle ratio shall be furnished to allow the vehicle to reach an approximate top speed of 65 MPH.

### **TIRES AND WHEELS**

Front tires shall be two (2) tubeless Michelin radials 385/65R22.50, 18 ply "all position" XZY-3wb tread. The tires shall be mounted on Alcoa 22.50" x 12.25" polished aluminum disc-type wheels with a ten (10) stud, 12.25" bolt circle.

Rear drive axle tires shall be four (4) tubeless Michelin radials 12R22.50, 16 ply "all position" XZY-3 road tread. The tires shall be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud-11.25" bolt circle.

### **LUG NUT COVERS**

Chrome plated lug nut covers shall be installed on all lug nuts.

### **HUB COVERS (front)**

Stainless steel hub covers shall be provided on the front axle. An oil level viewing window shall be provided.

### **HUB COVERS (Rear)**

A pair of stainless steel, high hat, hub covers shall be provided on the rear axle hubs.

### **WHEEL CHOCKS**

One (1) pair of folding Ziamatic SAC-44 aluminum alloy Quick-Choc wheel blocks with SQCH-44-H horizontal mounting brackets shall be provided. The chocks should be mounted under engineers compartment runningboard.

### **MUD FLAPS**

Mud flaps shall be installed behind the front and rear wheels of the apparatus.

### **ANTI-LOCK BRAKE SYSTEM**

The vehicle shall be equipped with a Wabco 4S4M, anti-lock braking system. The ABS shall provide a four (4) channel anti-lock braking control on both the front and rear wheels. It shall be a digitally controlled system that utilizes microprocessor technology to control the anti-lock braking system. Each wheel shall be monitored by the system. When any particular wheel begins to lockup, a signal shall be sent to the control unit. This control unit then shall reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

### **ANTI-LOCK BRAKE SYSTEM WARRANTY**

The Wabco ABS system shall come with a three (3) year or 300,000 mile parts and labor warranty provided by Meritor Wabco Vehicle Control Systems.

### **BRAKES**

The service brake system shall be full air type.

Front brakes shall be disc type designed for and by the independent front suspension manufacturer with automatic slack adjusters.

The rear brakes shall be 16.50 x 7.00 cam operated with automatic slack adjusters.

### **AIR COMPRESSOR, BRAKE SYSTEM**

The air compressor shall be a Bendix TRU-FLO 750 with 16.5 cubic feet per minute output.

### **BRAKE SYSTEM**

The brake system shall include:

- Bendix Westinghouse dual brake treadle valve with vinyl covered foot surface
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 4300 cubic inches or greater.
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi.
- MGM spring set parking brake system
- Parking brake operated by a Bendix-Westinghouse PP-1 control valve
- A parking "brake on" indicator light on instrument panel
- Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall be provided with an automatic spring brake application at 40 psi.
- Wabco System Saver 1200 air dryer.

### **BRAKE LINES**

Color coded nylon brake lines shall be provided. The lines shall be wrapped in a heat protective loom where necessary in the chassis.

### **AIR OUTLET**

One (1) air outlet with an "M" style female coupling shall be provided. The outlet shall be located in the driver side pump panel.

### **CHARGING SYSTEM**

Kussmaul Auto Charge D pump plus system shall be provide with a super auto eject shore line. The system "charger and air pump" shall be located under the rear seat riser in the cab or in a compartment in the cab.

The shore line connection shall be located in the driver side front bumper extension.

### **ENGINE**

A Caterpillar Diesel electronic engine as described below shall power the chassis:

Number of Cylinders: Six (6)

- Rated Brake Horsepower: 425 hp
- Torque: 1650ft lbs at 1200 rpm
- Governed Rpm: 2100

Standard equipment on the engine shall include the following:

- Air Cleaner: Farr or equal
- Fuel Filters: Dual, with check valve
- Coolant Filter: Spin-on with shut off valves (precharged with coolant inhibitor)
- Governor: Limiting speed type
- Lube Oil Cooler
- Lube Oil Filter: Full flow
- Starting Motor: 12-volt
- Turbocharger
- Air to Air Aftercooled

### **ENGINE WARRANTY**

The engine shall come with a five (5) year or 50,000 mile warranty provided by the Engine Manufacturer.

### **ENGINE BRAKE**

A Jacob engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver shall be able to turn the engine brake system on/off and have a high, medium and low setting.

The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system shall automatically disengage the auxiliary-braking device, when required.

### **ENGINE INSTALLATION CERTIFICATION**

The fire apparatus manufacturer shall provide, at the time of bid, a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The approval of the engine installation shall be at full horsepower rating in a continuous duty application under all operating conditions, including road and pump. No type of automatic horsepower reduction feature shall be allowed.

There shall be no exception to any portion of the engine installation certification. Nonconformance shall lead to immediate rejection of bid.

### **ENGINE AIR INTAKE**

The air intake with Ember Separator shall be mounted high on the passenger side of cab, to the front of crew cab door to prevent road dirt and recirculating hot air from entering the engine.

The Ember Separator shall be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch.

### **EXHAUST SYSTEM**

The exhaust system shall be 5.00" diameter.

The exhaust shall exit on the right side ahead of the rear wheels.

A heat deflector shield shall be provided where the tail pipe is routed under any side compartmentation.

Exhaust outlet to be constructed to conform with the **Plymovent** exhaust system.

### **EXHAUST INSULATION BLANKET**

An insulation "blanket" wrap shall be provided on the turbo charger and exhaust delivery pipe for reduction of heat to the cab. The "blanket" wrap shall extend down the exhaust delivery pipe to the bottom of the frame rail.

## **MANUAL FLUID CHECK ACCESS**

A central location for checking all engine compartment and transmission fluids shall be located in the cab area, through a door located on the engine tunnel cover. The engine oil dipstick shall allow for check only, and the transmission dipstick shall allow for check and fill.

An additional tube shall be provided for engine oil fill, located next to the engine check dipstick.

The door shall be insulated with the same material used in the engine tunnel area, and have a rubber seal.

Two (2) flush latches shall be provided on the access door.

## **ENGINE COMPARTMENT LIGHT**

Two engine compartment lights shall be installed under the engine hood, of which the switch is an integral part. Light shall have a .125" diameter deep hole in its lens to prevent moisture retention.

## **COOLANT LINES**

Silicone hoses shall be used for all engine/heater coolant lines installed by the chassis manufacturer.

Hose clamps shall be stainless steel "constant torque type" to prevent coolant leakage. They shall react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

## **RADIATOR**

Radiator and the complete cooling system shall meet or exceed NFPA cooling system standards. The radiator shall be no less than 1300 sq. inches in surface area. Cooling system capacity shall exceed all cooling requirements specified by the engine manufacturer under all truck operating conditions. It shall have a built-in low coolant sight glass and an electronically controlled low coolant display mounted on the instrument panel. An integral surge and deaeration tank shall be provided to optimize the cooling system for all operating conditions.

The cooling system shall be designed to maintain pressure at nine (9) psi for maximum dissipation. A drain valve shall be located at the lowest point of the cooling system and at other points to permit complete flushing of the coolant from the system. A heavy-duty fan, shrouded by recirculation shields that permit only fresh cool air through the radiator shall draw in cooling air.

Radiator shall be of the serpentine design and bonded together by the patented "beta-weld" process for increased strength, longer road life and solder-bloom corrosion protection. Radiator shall be mounted in a manner to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground.

Radiator core shall be compatible with commercial antifreeze solutions. Cooling system shall exhibit rapid warm-up without use of radiator shutters.

### **FUEL TANK**

A 75-gallon fuel tank (or larger) shall be provided and mounted at rear of chassis. The tank shall be constructed of 12-gauge, hot rolled steel. It shall be equipped with swash partitions and a vent.

A .75" drain plug shall be provided in a low point of the tank for drainage.

A fill inlet shall be located on the driver's side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Diesel Fuel Only".

A .50" diameter vent shall be provided running from top of tank to just below fuel fill inlet.

The tank shall meet all FHWA 393.67 requirements including a fill capacity of 95% of tank volume.

All fuel lines shall be provided as recommended by the engine manufacturer.

### **AUXILIARY FUEL PUMP**

An auxiliary electric fuel pump shall be added to the fuel line for repriming the engine.

### **TRANSMISSION**

An Allison EVS, electronic, torque converting, automatic transmission shall be provided.

One (1) PTO opening shall be located on left side and top of converter housing

A transmission temperature gauge, with red light and audible alarm, shall be installed on the cab instrument panel.

A five (5)-speed push button shift module shall be mounted to right of driver on console. Shift position indicator shall be indirectly lit for after dark operation.

### **TRANSMISSION COOLER**

An external transmission oil cooler shall be provided.

### **TRANSMISSION WARRANTY**

The transmission shall have a five (5) year/Unlimited mileage warranty covering 100% parts and labor. Warranty to be provided by Allison Transmission, not apparatus builder.

## **DRIVELINE**

Drivelines shall be a heavy duty metal tube and be equipped with Spicer 1810 universal joints.

The shafts shall be dynamically balanced before installation.

A splined slip joint shall be provided in each driveshaft, slip joint shall be coated with Glidecoat or equivalent.

## **CAB**

The cab shall be designed specifically for the fire service and manufactured by the chassis builder as a heavy duty chassis.

Construction of the cab shall be aluminum welded to extruded aluminum sub frame.

The apparatus manufacturer in a facility located on the manufacturer's premises shall build the cab.

The cab shall be the manufacturer's long four door fire service cab.

The cab shall be 96.00" wide, with an interior width of 85" to 90".

The forward cab section overall height (cab roof to ground) shall be approximately 100.00".

The floor to ceiling height inside the crew cab shall not be less than 60.00"

The crew cab floor shall measure approximately 45.00" from rear wall to the back side of engine tunnel.

The crew cab shall be of the totally enclosed design, with access doors constructed in the same manner as the driver and passenger doors.

The crew cab area shall have a 10" raised roof with windows.

The cab shall be a full tilt cab style. The engine shall be easily accessible and capable of being removed with the cab tilted.

The cab shall have three (3)-point rubber mounting and shall be tilted by a hydraulic pump connected to two (2) cab lift cylinders. The cab shall then be locked down by a two (2)-point automatic locking mechanism that actuates after the cab has been lowered.

The cab access steps shall be approximately 22.00" wide x 8.00" minimum depth with a slip resistance surface such as grip strut or expanded metal, tread plate step surface will not be excepted.

These steps shall be lighted.

The inside cab steps shall not exceed 16.50" high.

The crew cab entrance shall be a two (2) step design for easy access.

A 20.00", slip resistant, handrail shall be provided adjacent to all door openings to assist entrance into the cab.

A slip resistant, handrail shall be provided adjacent to the steering wheel to assist the drivers entrance into the cab.

A rubber covered handrail shall be provided inside each front cab door, adjacent to the door posts.

A slip resistant handrail shall be provided on the inside of each crew door, "Chicago style".

All cab doors shall be approximately 35.00" wide x 69.00" high, barrier style doors.

The cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness of not less than .125". The exterior skins shall be constructed of not less than .090" aluminum.

Flush mounted, chrome plated paddle type door handle shall be provided on the exterior of the cab doors.

All interior cab door handles shall also have flush paddle handles.

The door hinge shall be a stainless steel piano type with a .25" pin.

There shall be double automotive type rubber seals around the perimeter of the door framing and door edges to ensure a weather tight fit.

Brushed stainless steel scuff plates shall be installed on the inside of all cab doors, extending from the bottom of the door to the top.

Cab door panels shall be removable without disconnecting door and window mechanisms.

Engine hood side walls shall be constructed of .50" aluminum, top shall be constructed of .19" aluminum and shall be tapered at top to allow for more driver and passenger elbow room.

The engine hood shall be insulated for protection from heat and sound. The noise insulation keeps the DBA level within the limits stated in the current NFPA series 1900 pamphlet.



Full circular inner fender liners, in the wheel wells, shall be provided.

Two compartments shall be provided, one each side, in the rear cab extension below the floor level with a minimum open area of 11" W X 14" D X 30" H or as large as possible. The doors shall be water tight, painted body color and with slam latches. This compartment shall have a light that comes on automatically with the open door. It shall be vented into the cab as to allow conditioned air from the cab to flow freely through the compartment.

A curved, safety glass windshield shall be provided, with over 2,754 square inches of clear viewing area.

The cab windshield shall have bright trim inserts in the rubber molding holding the glass in place.

All cab glass shall be tinted with a high quality UV blocking tint.

Economical windshield replacement glass shall be readily available from local auto glass suppliers.

Two (2) sunvisors, 8.75" x 31.00" long, shall be provided. The sunvisors shall be located above the windshield with one (1) mounted on each side of the cab.

Two (2) Electric windshield wipers with washer shall be provided that meet FMVSS and SAE requirements.

The washer reservoir shall be able to be filled without raising the cab.

The cab and crew cab floor areas shall be covered with an acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam.

### **CAB WARRANTY**

The bidder shall furnish a ten (10) year cab warranty. The warranty shall cover defects in design or workmanship in the cab tubular support and mounting supports and other cab structural components identified in the specifications. A copy of the warranty shall be submitted with the bid. (No exceptions)

### **CREW CAB WINDOWS**

On each side of the crew cab, a window with tinted glass with UV block shall be provided.

### **ELECTRIC WINDOWS (cab doors)**

All cab doors shall be equipped with electric operated windows.

The control for each door shall be an automotive style located on the inside door panel within easy reach of the driver, officer, or firefighters but not in a location as to where the occupant can contact the switch with their knees or other personal equipment.

The driver shall also have a control to operate all of the cab windows, a single control shall be located on the driver's lower instrument panel.

### **FENDER CROWNS**

Stainless steel fender crowns shall be installed at cab wheel openings.

### **DOOR JAM SCUFFPLATES**

All cab door jambs shall be furnished with a stainless steel scuff plate, mounted on the striker side of the jam.

### **CAB LIFT**

A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

An 8' remote control shall be provided for raising and lowering the cab. The remote control shall be stored in the cab. The receptacle for the remote control shall be located on the passenger side pump panel.

Cab shall be locked down by a two (2)-point automatic spring loaded hook mechanism that actuates after the cab has been lowered.

The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

A redundant mechanical stay arm shall automatically be engaged once the cab has been fully raised. Before lowering the cab, this device must be disengaged using the stay arm control located near the cab raise/lower switch.

A backup manual hydraulic pump shall also be provided.

### **INTERLOCK, CAB LIFT TO PARKING BRAKE**

The cab lift system shall be interlocked to the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the ignition switch is in the on position, if the parking brake is released the cab tilt mechanism shall be disabled.

## **MIRRORS**

Door mounted Ramco 6002CCHR-Pol mirrors with integral convex mirrors. Driver and passenger side mirrors shall be heated and adjustable with remote control convenient to the driver.

## **CAB INTERIOR**

The cab dash fascias shall be a wrap-around design to provide easy access of controls and shall be constructed as a heavy duty use cab interior or out of high impact ABS plastic, metal, or vinyl where needed.

The engine tunnel shall be padded and covered with 46 ounce leather grain vinyl resistant to oil, grease and mildew.

The headliner shall be installed in both forward and rear cab sections. Headliner material shall be vinyl. A sound barrier shall be part of its composition. Material shall be installed on aluminum sheet and securely fastened to interior cab ceiling.

Forward portion of cab headliner shall provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

## **CAB INTERIOR UPHOLSTERY**

The cab interior upholstery shall be red 46 oz vinyl.

## **INTERIOR PAINT (Cab)**

The cab interior metal surfaces shall be painted dark gray, vinyl texture paint.

## **CAB SEATING**

A Seats Inc. #911 Magnum 100 "knee-action" air-ride style seat with high-back shall be provided in the cab for the driver and officer.

The seats shall have 3.00" of height adjustment, 6.00" front to rear adjustment, and with "knee-action" suspension.

Both seats shall be furnished with three (3)-point shoulder type seat belt. The seat belt shall be furnished with automatic retractor. Extension shall be provided with the seat belt so the male end can be easily grasped and the female end easily located while sitting in a normal position.

## **SEATING (Forward Facing Crew Cab)**

Three (3) forward facing Seats Inc. #911 Magnum 100 style seat with high-back shall be provided in the cab for the firefighters evenly spaced along the rear wall of the cab.

The seats shall be furnished with three (3) point shoulder type seat belts. The seat belts shall be furnished with automatic retractors. Extensions shall be provided with the

seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

### **IN CAB SCBA MOUNTS**

Two (2) Ziamatic SCBA brackets, with a "knock-down" bracket and collision restraint holding strap, meeting NPFA standards shall be installed in the cab in the rear ward facing seat pedestal area in as safe an area as possible for the riding occupants and in such a location that they can be removed from the cab from a standing position outside the cab. The bracket shall accommodate the Scott SCBA Model AP50 with 45 minute bottles.

### **ADDINATIONAL SCBA MOUNTS**

Two (2) additional SCBA brackets in the body shall have a Ziamatic, SCBA holder with a "knock-down" bracket and collision restraint holding strap to accommodate Scott SCBA Model AP50 with 45 minute bottles. The bracket shall be adjustable up and down by simply unbolting, relocating and rebolting in desired position.

### **BOOK BIN**

There shall be a book bin provided and located between the officers and drivers seats. This bin shall be of a size that will hold various maps, 2 medical glove boxes, 2 cup holders and 4 (3") note books.

### **RADIO COMPARTMENT**

A radio compartment shall be provided under the officer's seat.

The inside compartment dimensions shall be 14.13" deep x 15.75" across x 5.25" high.

A drop-down door with a chrome plated lift and turn latch shall be provided for access.

The compartment shall be constructed of smooth aluminum and painted to match the cab interior.

### **CAB INTERIOR LIGHTING**

Auxiliary lights shall be provided in the cab and consisting of:

- One (1) Clear Dome Light: Centered, and controlled by automatic door switches.
- One (1) Weldon 8086 Dome Light: Above officer's seat, controlled by a thumb switch on light.
- One (1) Weldon 8086 Dome Light: Above driver's seat, controlled by a thumb switch on light.
- Two (2) Adjustable Map Lights: With switches mounted on the cab ceiling.
- A Courtesy Light at Each Door Opening: Controlled by automatic door switches.

- Driver and officer foot-well red lighting controlled by switch on the instrument panel.

### **CREW CAB INTERIOR LIGHTING**

Auxiliary lights shall be provided in the crew cab and consist of:

- Two (2) clear dome lights with integral switch, one each side of crew cab, controlled by automatic door switches.
- Two (2) red dome lights, controlled by a thumb switch on light, one each side of crew cab located over the two outside seats.
- A courtesy light at each door opening, controlled by automatic door switches

### **CAB HEATER**

There shall be a 40,000 BTU heater in the cab located below the right side cab dash.

The heater/defroster ventilation shall be built into the design of the cab dash instrument panel.

The heater ducts shall be vented in a manner to provide heat directed towards the officer and the driver.

The defroster ducts shall be designed to provide maximum defrosting capabilities for the front cab windows.

Heater defroster controls shall be located on the cab dash within easy reach of the driver.

### **CREW CAB HEATER**

An auxiliary heater with 50,000 BTU shall be provided inside the crew cab. The heater shall have a three (3) speed blower, and temperature controls located adjacent to the heater.

### **AIR CONDITIONING**

A high performance low profile air conditioning system shall be furnished inside the cab and crew cab.

The air conditioning system shall perform as follows:

In 100 degree Fahrenheit ambient temperature with 50 percent relative humidity and at maximum compressor speed, the cab and crew cab shall cool down to 75 degrees Fahrenheit within 30 minutes. Actual test results from the manufacturer of the air conditioning system, verifying this performance requirement, shall be submitted with bid.

A 19.1 cubic inch compressor will be installed on the engine.

The entire unit will be mounted externally with a painted body color white enclosure, with adequate BTU to meet the performance specification, will be installed on the cab roof.

There will be air flow outlets located in the following locations:

- Two (2) in the ceiling, just above the driver and the officer
- Six (6) in the crew cab, mounted in ceiling, positioned to maximize cooling

The evaporator units will have an adequate BTU rating to meet the performance specifications.

The air conditioning system will have adjustable air outlets incorporated into the cab ceiling at both the driver, officer, and crew cab positions.

The air conditioner refrigerant shall be R-134A, installed by a certified technician.

The cab and crew cab walls shall be insulated with 2.00" insulation where possible and the roof with 1.00" insulation to aid in cooling.

The insulation shall be covered with a vinyl liner or a metal panel painted to match the interior.

### **CAB INSTRUMENTATION**

Instrument panel controls and switches shall be identified as to function by imprinted word(s) adjacent to each item. Actuation of the headlight switch shall illuminate ("back-lite") wording for after dark operation. Turn signal and high beam headlight indicator lights shall also be provided.

To avoid confusion, warning indicators shall be (where possible) the "dead front" type, meaning the warning light and word identification of same does not show up unless it is necessary.

Instrument panel gauges, vehicle lights and other electrical accessories shall use proper size wiring to accommodate expected current load. Wiring shall meet SAE J-1128 specifications for high temperature (250 degrees Fahrenheit min.) conditions and be color, number and function coded.

Cab instruments and controls shall be conveniently located within the forward cab section. Gauges and emergency vehicle switches shall be installed on removable panels for ease of service. The following gauges and controls shall be furnished:

- Fluid Level Checks (in display) with LCD message upon start up:
  - \* Engine Oil
  - \* Engine Coolant

- \* Power Steering Fluid
- \* Fuel
- Transmission level check (in shift pad)
- Speedometer/Odometer: Electric
- Tachometer: Electric
- Hour meter for Engine
- Pump Hour Meter
- Engine Oil Pressure Gauge: Red warning indicator light with and audible alarm
- Engine Coolant Temperature Gauge: Red warning indicator light with and audible alarm
- Automatic Transmission Oil Temperature Gauge: Red warning indicator light with and audible alarm
- Two (2) Air Pressure Gauges: One (1) red warning indicator light with separate for front and rear air and audible alarm
- Voltmeter: Two (2) stage low and two (2) stage high voltage, warning indicator light with and audible alarm
- Stop Engine Warning Indicator Light: Red with and audible alarm
- Check Engine Warning Indicator Light: Amber with and audible alarm
- Fuel Gauge: Two (2) stage low fuel warning indicator light (amber) with and audible alarm
- Ignition Switch: Green ignition on indicator light
- Push Button Engine Start Control Switch
- Heater and Defroster Controls
- Headlight Switch
- Self Canceling Turn Signal Switch (arm)
- Headlight Dimmer and Hazard Switch: Incorporated into turn signal arm

- Emergency Warning Light Control Panel
- Parking Brake Control: Red parking brake on indicator light
- Horn Button Control: Center of steering wheel.
- High Air Restriction Warning Indicator Light: with red warning indicator and audible alarm.
- One two (2)-speed Windshield Wiper Control with Intermittent Feature. The control shall also have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use
- Windshield Washer Controls.
- PTO Switch for the generator with Indicating Light

### **HIGH IDLE**

A high idle switch shall be provided, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed, at the cab instrument panel, for activation/deactivation.

The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided adjacent to the switch. The light shall illuminate when the above conditions are met. The light shall be labeled "OK To Engage High Idle".

### **"DO NOT MOVE APPARATUS" INDICATOR**

A rotating red indicator light (located in the driving compartment, in clear view of the driver) shall be illuminated automatically per NFPA (1996 edition, 9-11 or 1999 edition 11-11). The light shall be labeled "Do Not Move Apparatus If Light Is On".

### **MESSAGES, DISPLAY, Do Not Move Truck**

There shall be seven (7) messages displayed in the cab. The messages shall designate the specified location of what door is opened or other applicable option is not in the moving position. The following messages shall be displayed:

- Driver's Side Cab Door Open
- Driver's Side Body Door Open
- Passenger's Side Cab Door Open
- Passenger's Side Body Door Open



- Rear Body Doors Open.
- Deck Gun Not Stowed
- Hose Bed Doors Open

### **SWITCH PANELS**

The built-in emergency light switch panel shall have a master switch plus individual switches for selective control. The switch panel shall be located in the "overhead" position above the windshield on the driver's side to allow for easy access. Switches shall be rocker style with an indicator light, of which is an integral part of the switch. A test switch shall be provided for testing the clear warning lights deactivated by the park brake circuit.

### **12 VOLT OUTLETS**

There will be two (2) 12 volt power outlet (cigarette lighter type) receptacles provided in the cab. The receptacles will be located where designated by the Fire Department upon review of the engineering drawings.

### **RADIO ANTENNA MOUNT**

Four (4) antenna mounting bases, Model MATM with 17 feet of coax cable and weatherproof cap shall be provided for any needed communication equipment.

The mounts shall be located on the cab roof evenly spaced and distanced apart to prevent shielding, feed back, and to provide a uniform look.

Two of the cables shall be routed to the officer side seat box with enough cable for customer to route to the instrument panel if needed.

Two of the cables shall be routed to the instrument panel in a location suitable for mounted radio equipment.

Identify each cable at the end as to its location on the cab roof.

### **FIRE-COM INTERCOM/ RADIO INTERFACE**

A Fire-Com **TM** 3020R intercom/radio interface system shall be installed in the cab **with** two patch cables provided to connect to two (2) Motorola mobile radios

The system shall have five (5) headset positions in the cab. The driver and officer shall have intercom as well as radio interface. The crew area shall have active intercom only.

There shall be four headsets provided, two (2) UH-10 and two (2) UH-40

There shall be a headset port provided at the pump panel, and left rear tail board area. All of these ports shall have intercom and radio interface.

## **ELECTRICAL POWER CONTROL SYSTEM**

Electrical compartments shall be provided in the cab and on the chassis to house the vehicles electrical power and signal circuit protection and control components. The power and signal protection and control compartments shall contain circuit protection devices, power control devices, and vehicle interface modules. Power and signal protection and control components shall be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray. Serviceable components shall be readily accessible.

Circuit protection devices, which conform to SAE standard, shall be utilized to protect each circuit. All circuit protection devices shall be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers shall be Type-I automatic reset (continuously resetting) or Type-II (manual resetting) and conform to SAE J553 or J258. When required, automotive type fuses conforming to SAE J554,1284,1888 or J2077 shall be utilized to protect electronic equipment.

Power control relays and solenoids shall have a direct current (dc) rating of 125 percent of the maximum current for which the circuit is protected.

- Automatic self-test on startup and during vehicle operation
- Eliminate control logic relays wherever possible
- Provide logic control for NFPA 1901 mandated safety interlocks and indicators
- Utilize system integration to eliminate redundant wiring and components
- Improve control system reliability by reducing relay and connector contacts
- Advanced electrical system load management and sequencing system
- Complete operating and troubleshooting manuals

## **INDICATOR LIGHT AND ALARM PROVE-OUT**

A system shall be provided which shall automatically test basic indicator lights and alarms located on the cab instrument panel.

## **VOLTAGE MONITOR SYSTEM**

A voltage monitor system shall be provided to indicate the status of the battery system connected to the vehicles electrical load. The monitor system shall provide visual and audio warning when the system voltage is below optimum levels.

The alarm shall activate if the system falls below 11.8 VDC for more than two (2) minutes.

## **POWER AND GROUND STUDS**

Five (5) studs shall be provided in the electrical component compartment for two-way radio equipment. The studs shall consist of:

- Stud one shall be 12-volt 40-amp, controlled by battery switch and labeled.
- Stud two shall be 12-volt ground and labeled.
- Stud three shall be 12-volt 60-amp, controlled by ignition switch and labeled.
- Stud four shall be 12-volt 60-amp, battery direct and labeled.
- Stud five shall be 12-volt 40-amp, mounted in the headliner above the officers seat and controlled by the battery switch.

Adequate access shall be provided to allow easy running of wiring into and out of the compartment. The access shall have a grommet to protect the wiring from chafing.

## **EMI/RFI PROTECTION**

The electrical system proposed shall reduce undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components shall be used to insure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The apparatus proposed shall have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor shall be able to demonstrate the EMI and RFI testing which has been done on similar apparatus and certifies that the vehicle proposed meets SAE J551 requirements.

Applying appropriate circuit designs and shielding shall control EMI/RFI susceptibility. The electrical system shall be designed for full compatibility with low level control signals and high powered two (2)-way radio communication systems. Harness and cable routing shall be given careful attention to minimize the potential for conducting and radiated EMI-RFI susceptibility.

## **BATTERY SYSTEM**

A single starting system shall be provided with the following minimums, utilizing six (6) 12 volt, 950 CCA, 210 reserve capacity, high cycle, maintenance-free, group 31 batteries with a system rating of 6000 CCA at 0 degrees Fahrenheit and 1260 minutes of reserve capacity.

An ignition switch and starter button shall be located on the instrument panel. The starter button shall be wired to a heavy-duty solenoid.

An indicator light shall be provided on the instrument panel to notify the driver the status of the battery system.

### **MASTER BATTERY SWITCH**

A red master battery switch, to activate the battery system, shall be provided inside the cab within easy reach of the driver.

### **BATTERY COMPARTMENTS**

Batteries shall be placed on non-corrosive mats and be stored in well ventilated compartments.

Heavy-duty battery cables shall be used to provide maximum power to the electrical system. Cables shall be color coded.

Battery terminal connections shall be coated with anti-corrosion compound. Battery solenoid terminal connections shall be encapsulated with semi-permanent rubberized compound.

### **JUMPER STUDS**

One (1) set of battery jumper studs with plastic color coded covers shall be installed to allow enough room for easy jumper cable access. A tag shall be provided for positive/negative terminals will be located on the driver's side of the chassis.

### **ALTERNATOR**

A 340 amp Niehoff alternator shall be provided. It shall have a rated output current of 340 amp as measured by SAE method J56. It shall have a high volume air cooling fan and fan guard. The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

### **ELECTRONIC LOAD MANAGER**

An electronic load management (ELM) system shall be provided that monitors the vehicles 12-volt electrical system, automatically reduces the electrical load in the event of a low voltage condition, and automatically restores the shed electrical loads when the low voltage condition expires. This ensures the integrity of the electrical system. The ELM shall monitor the vehicle's voltage while at the scene (parking brake applied).

The system shall have the following features:

- System voltage monitoring
- Electrical load shedding
- Sixteen available load shedding levels
- Priority levels can be set for individual outputs

- Individual switch "on" indicator to flash when the particular load has been shed
- Digital display shows system voltage.
- Indicator in the Indicator Light Module, indicates when the Load Manager is active.

### **SEQUENCER**

A warning light sequencer shall be provided that automatically turns the emergency lights on and off in a preset sequence.

The sequencer shall be wired in conjunction with the emergency master light switch.

When the switch is activated the lights shall be turned on in sequence one by one at 1/2 second intervals thereby protecting the alternator from power surges. Sequenced light switch LED's shall flash while waiting for activation.

When turned off the same process shall deactivate the warning lights in sequence to allow a gradual decrease in alternator output, rather than dumping the load.

### **AMP DRAW REPORT**

The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus shall provide the following:

- 1) Documentation of the electrical system performance tests.
- 2) A written load analysis, which shall include the following:
  - A) The nameplate rating of the alternator.
  - B) The alternator rating under the conditions specified per NFPA 1901, section 9-3.1.
  - C) The minimum continuous load of each component that is specified per NFPA 1901, section 9-3.2.
  - D) Additional loads that, when added to the minimum continuous load, determine the total connected load.
  - E) Each individual intermittent load.

The bidder per NFPA 1901 shall provide all of the above listed items, section 9-15.

### **EXTERIOR LIGHTING**

Exterior lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal.

Front headlights shall be halogen; rectangular quad type mounted in a chrome and polished aluminum housing.

Eleven (11) LED style clearance/marker lights with armored mounting brackets shall be provided on the cab roof as well as the rear of the apparatus. (Three (3) to the front and one (1) on each corner.) and Two (2) on each rear corner.

### **DIRECTIONAL (Front)**

Front turn signals to be sequenced LED amber lamps housed in chrome bezels. The turn signals will be housed in the same common bezels as the front warning light and will be located above the headlights.

In addition to the front facing directional, a K-D Lamp Company, Model 856-31055, marker/turn indicator shall be provided on each side of the cab.

### **DAYTIME RUNNING LIGHTS (HEADLIGHTS)**

The headlights shall include a feature for daytime running lights, which shall be automatically activated when the truck is running and parking brake is released. The daytime running light feature shall be deactivated when the primary headlight switch is turned on or when other headlight options are activated.

### **LIGHT, DIRECTIONAL, MIDSHIP**

Two (2) Whelen, Model 60A00TAR, amber LED arrow directional lights shall be provided on the exterior back of the cab, one (1) each side. The lights shall be mounted low on the back wall of the cab.

The lights shall be mounted in a Whelen , 6EFLANGE type bracket.

### **BACK-UP ALARM**

An ECCO, Model SA917-PM2, solid state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum five (5) db above surrounding environmental noise levels.

### **MANUALS, BODY**

There shall be three (3) pump and body manuals provided with the completed unit at time of delivery. Shall be CD-ROM version.

Parts description in the manuals shall be the expanded drawing type, showing all component parts.

### **MANUALS, CHASSIS PARTS**

Three (3) parts manuals for the chassis shall be provided with the completed unit. Shall be CD-ROM version.

Part descriptions shall be of the expanded drawing type showing all component parts.

The manuals shall be specifically for the chassis model being purchased. It shall not be a generic manual for a multitude of different chassis.

### **MANUALS, CHASSIS SERVICE**

Three (3) chassis service manuals containing parts and service information on major components shall be provided with the completed unit. Shall be CD-ROM version.

### **MANUALS, CHASSIS OPERATION**

Three (3) illustrated chassis operation manuals shall be provided. Shall be CD-ROM version.

### **VIDEO TRAINING TAPES**

There shall be two (2) set sets of first level maintenance video training tapes for the chassis and fire pump provided.

### **ELECTRICAL WIRING DIAGRAMS**

Three (3) electrical wiring diagrams, prepared for the model of chassis, body and aerial, shall be provided. Prefer on CD-ROM.

### **BUMPER**

A one (1) piece, ten (10) gauge, 304-2B type polished stainless steel bumper, a minimum 10.00" high shall be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper shall be extended 26.00" from front face of cab.

Documentation shall be provided, upon request to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart shall be provided to indicate the option locations and shall include, but not be limited to the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), discharge connections. Any thing mounted on the bumper shall allow for full cab tilt.

### **HOSE TRAY (Front Bumper Preconnected Handline)**

A hose tray constructed of aluminum will be placed in the center of the bumper extension. Refer to the enclosed photo's of other Monroe Fire trucks.

The tray will have a capacity of 200' of 1 3/4" double jacket cotton-polyester hose with a model # 1765 Akron nozzle. The line shall be plumbed from the pump panel with 2.00 i.d. pipe, gated with a 2.00" quarter turn ball valve and terminate on top of the bumper inside the tray cover with a chrome 1-1/2" NST 90deg elbow. The line shall have a pressure gauge showing line pressure. It shall also be plumbed into the foam system.

### **COVER, HOSE TRAY**

A bright aluminum tread plate cover will be provided over the one (1) hose tray.

The cover will be attached with a stainless steel hinge.

A rubber strap with lope and pin latch will secure the cover in the closed position and mechanical hydraulic stay arms will hold the cover in the open position.

A red vinyl cover should be provided that can be folded out of the tray and over the bumper in order to prevent the bumper from being damaged.

Refer to the enclosed photo's of other Monroe Fire trucks. (last page)

### **GRAVEL PAN**

A gravel pan, constructed of bright aluminum tread plate, shall be furnished between the bumper and cab face.

### **TOW EYES**

Two (2) polished stainless steel tow eyes shall be installed through the front bumper and attached to the front frame members. The inner and outer edges of the tow eyes shall be radiused.

### **WATER TANK**

It shall have a minimum water capacity of 750 gallons and shall be constructed of polypropylene plastic in a rectangular shape.

The tank shall have integrated Class A foam cell with a capacity of 30 gallons

The tank shall have integrated Class B foam cell with a capacity of 30 gallons

The foam cells shall not reduce the water capacity of the tank below 750 gallons.

The tank shall be baffled in accordance with NFPA Bulletin 1901 requirements.

The baffles shall have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments.

The longitudinal partitions shall be constructed of .38" polypropylene plastic and extend from the bottom of the tank through the top cover to allow positive welding. The transverse partitions extend from 4" off the bottom to the underside of the top cover.

All partitions interlock and shall be welded to the tank bottom and sides.

The tank top shall be constructed of .50" polypropylene. It shall be recessed .38" and shall be welded to the tank sides and the longitudinal partitions.

It shall be supported to keep it rigid during fast filling conditions.



Construction shall include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions.

Two of the dowels shall be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump shall be provided at the bottom of the water tank. The sump shall include a drain plug and the tank outlet.

Tank shall be installed in a fabricated "cradle" assembly constructed of structural steel.

Sufficient cross members are provided to properly support bottom of tank.

Cross members are constructed of steel bar channel or rectangular tubing.

Tank "floats" in cradle to avoid torsional stress caused by chassis frame flexing.

Rubber cushions, .50" thick x 3.00" wide, shall be placed on all horizontal surfaces that the tank rests on.

Stops are provided to prevent an empty tank from bouncing excessively while moving vehicle.

Tank mounting system is approved by the manufacturer. Fill tower shall be constructed of .50" polypropylene and shall be a minimum of 8.00" wide x 14.00" long.

Fill tower shall be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, shall be installed approximately halfway down the fill tower and extend through the water tank and dump to the rear of the rear axle.

### **WATER TANK WARRANTY**

The tank shall have a **lifetime** warranty.

### **HOSE BED**

The hose body shall be fabricated of .125"-5052 aluminum with a 38,000 psi tensile strength.

The sides of the hose bed shall not form any portion of the fender compartments. Double wall construction shall be used in forming the sides of the apparatus body and hose bed.

The upper edges of side panels shall have a double break for rigidity.

Flooring of the hose bed shall be removable aluminum grating with the top surface corrugated to aid in hose aeration.

The grating slats shall be .50" x 4.50" with spacing between slats for hose ventilation.

Hose capacity shall be a minimum of 1200 feet of 5.00" large diameter hose and 800 feet of 2.5" hose.

The hose bed shall have three hose bed dividers.

A hinged, center opening aluminum tread plate hose bed cover shall be provided.

Any support bars needed for the cover shall be removable, without the use of hand tools, during hose loading.

There shall also be a red vinyl flap that covers the opening of the rear of the hose bed from the hose bed cover to the floor of the hose bed. This cover shall be removable and held on by snaps, or twist locks. Velcro will not be excepted.

The truck design shall be in such away as to locate the hose bed as low as possible to the ground for firefighter safety during deployment and loading of the hose.

### **RUNNING BOARDS**

The running boards shall be fabricated of .125" bright aluminum tread plate and supported by structural steel angle assemblies bolted to the chassis frame rails.

Running boards shall be 11.75" deep and are spaced away from the body .50".

A splash guard shall be provided to keep road dirt or water from splashing up onto the pump panels.

The running boards shall have a riser on the body to protect the painted surface from damage by stepping on the running boards.

The entire rear surface of the unit shall be covered with bright aluminum tread plate.

The running boards located at both the left and right pump panels shall have a removable or floating hose well designed to hold a 25' x 5" hose with a strap.

### **TOW BAR**

A tow bar will be installed under the tailboard at center of truck.

Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail.

Tow bar assembly will be designed and positioned to allow up to a 30 degree upward angled pull of 17,000 pounds, or a 20,000 pound straight horizontal pull in line with the centerline of the vehicle.

Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

### **AGGRESSIVE WALKING SURFACE**

All exterior surfaces designated as stepping, standing, and walking areas shall comply with the required average slip resistance of NFPA section 13-7.3.

### **COMPARTMENTATION**

Compartmentation shall be fabricated of aluminum with a minimum spec of .125", 5052-H32 aluminum with a tensile strength range of 31,000 to 38,000.

The side compartments shall be an integral assembly with the rear fenders.

Fully enclosed rear wheel housings shall be provided to prevent rust pockets and for ease of maintenance.

Mounting of the compartments shall be done with body support assemblies bolted to the chassis frame rails and compartment floors.

Support assemblies shall be constructed of minimum 3.00" steel channel properly coated to isolate the dissimilar metals.

The side body panels shall be mounted independently of each other with the left panel mounted to the left frame rail and the right panel mounted to the right frame rail.

The compartment flooring shall be of the sweep out design with the floor higher than the compartment door lip.

Drip protection shall be provided over all door openings by means of bright aluminum extrusion or formed bright aluminum tread plate.

The side compartment tops shall be covered with bright aluminum tread plate with a 1.00" rolled over edge on the front, rear and outward sides.

The covers shall be fabricated in one (1) piece with the corners "TIG" welded.

A bright aluminum tread plate cover shall be provided on the front wall of each side compartment.

All screws and bolts, which protrude into a compartment, shall have acorn nuts at the ends to prevent injury.

## **UNDERBODY SUPPORT SYSTEM**

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.

The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame will be mounted on the top of these supports to create a "floating substructure" which will result in a 500 pound equipment support rating per lower compartment.

The "floating substructure" will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators will have a broad load range, proven viability in vehicular applications, be of a fail safe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators will be installed in a modified "V" three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

A design with body compartments hanging on the chassis in an unsupported fashion will not be acceptable.

## **LOUVERS**

All body compartments shall have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers shall be formed into the metal and not added to the compartment as a separate plate.

## **BODY WARRANTY**

A copy of the fire apparatus manufacturer's warranty shall be included with the bid. The warranty shall state that the body shall be free of structural failures caused by defective design or workmanship for a warranty period of ten (10) years from the date the new vehicle is first delivered or 100,000 miles, whichever occurs first and that defective parts, under the warranty, shall be repaired or replaced without charge to the original purchaser.

### **COMPARTMENTATION, DRIVERS SIDE**

A full height compartment, ahead of the rear wheels, approximately 40" wide x 65" high x maximum depth (full depth) available with a door opening of approximately 40" wide x 60" high. With painted roll up style closure.

One (1) door compartment, over the rear axles. The compartment shall be approximately 72" wide x 33" high x maximum depth (full depth) available inside with a door opening of approximately 65" wide x 30" high. With painted roll up style closure.

A full height compartment, behind the rear wheels, approximately 40" wide x 65" high x maximum depth (full depth) available with a door opening of approximately 40" wide x 60" high. The compartment shall be subdivided with an aluminum wall from floor to ceiling to allow separation for the enclosed 110 volt cord reel mounted on the floor of the compartment and an area for turnout gear storage with an a mounted SCBA in the upper section. The cord reel shall have a fully removable enclosure to allow for servicing of the reel. With painted roll up style closure.

### **COMPARTMENTATION, PASSENGERS SIDE**

A full height compartment, ahead of the rear wheels, approximately 40" wide x 65" high x maximum depth available deep with a door opening of approximately 40" wide x 60" high. With painted roll up style closure.

One (1) compartment, over the rear axles. The compartment shall be approximately 72" wide x 33" high x maximum depth available inside with a door opening of approximately 65" wide x 30" high. With painted roll up style closure.

A full height compartment, behind the rear wheels, approximately 40" wide x 65" high x maximum depth available with a door opening of approximately 40" wide x 60" high. The compartment shall be subdivided with an aluminum wall from floor to ceiling to allow separation for the enclosed 110 volt cord reel mounted on the floor of the compartment and an area for turnout gear storage with an a mounted SCBA in the upper section. The cord reel shall have a fully removable enclosure to allow for servicing of the reel. With painted roll up style closure.

### **COMPARTMENTATION, Rear**

There shall be a rear compartment designed to be as large as possible below the hose bed area. With non painted roll up style closure. The rear of the apparatus shall have a tread plate tail board step area with steps to access the hose bed area and a tread plate bumper minimum of 4" x 4".

### **DRY DECKING**

All compartment floors, shelves, and roll out trays shall be covered with red **Turtle Tile** dry decking. The exposed edges shall be finished with **Turtle Tile** edging.

### **ADJUSTABLE SHELVES**

There shall be nine (9) shelves, with a minimum capacity of 250 pounds provided. The shelf construction shall consist of .125" pan-shaped aluminum with 2.00" sides. Each shelf shall be infinitely adjustable by means of a threaded fastener, which slides in a track.

The location of the shelf/shelves shall be determined by the fire dept. after review of engineer drawings.

### **MOUNTING TRACKS**

There shall be nine (9) sets of tracks for mounting shelf(s) in each compartment. These tracks shall be installed vertically to support the adjustable shelf(s).

### **ROLL OUT TRAYS**

There shall be three (3) roll out trays provided. The location shall be provided by the fire dept. after review of the engineer drawings.

### **TOOL BOARDS**

There shall be two (2) pull out or swing out tool boards made of metal pegboard.

There shall be two (2) pegboard walls provided in the rear of two compartments located per the fire department.

Two (2) shall be located per the fire department, past the pump panel, left and right side of the apparatus. They shall be the full size of the door opening. A positive latching device that can be operated with a gloved hand, shall be used to hold the board closed

### **RUB RAIL**

Bottom edge of the side compartments shall be trimmed with a bright aluminum extruded rub rail.

Trim shall be approximately 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails shall not be an integral part of the body construction, which allows replacement in the event of damage.

### **BODY FENDER CROWNS**

Stainless steel fender crowns shall be provided around the rear wheel openings.

A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering.

## **HOSE TROUGHS**

There shall be one hose trough on each side of the body, two (2) total, above the compartments capable of holding one (1) ten foot piece of 6" hard sleeve hose.

## **HANDRAILS**

The handrails shall be minimum 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

Chrome plated end stanchions shall support the handrail. Plastic gaskets shall be used between end stanchions and any painted surfaces.

Drain holes shall be provided in the bottom of all vertically mounted handrails.

- Two (2) handrails shall be provided above each side pump panel.

## **STEPS**

A minimum of three (3) bright finished folding steps shall be provided on the front of each fender compartment for access to the hose bed. Step spacing per NFPA 1901.

## **AIR BOTTLE STORAGE (4 scba bottles)**

A total of four (4) air bottle compartments shall be provided in order to accommodate four (4) SCBA bottles. Two on the drivers side fender panel and two on the passenger side. The air bottle compartment shall be in the form of a round tube (7.63" diameter minimum) and of adequate depth to accommodate different size air bottles. Flooring shall be rubber lined and have a drain hole. A sealed stainless steel door as to prevent road grime from entering the compartment with a chrome plated latch shall be provided to contain the air bottle. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the body sheet metal.

## **GROUND LADDERS**

The following Alco-Lite ladders shall be furnished and must meet or exceed the latest NFPA and ISO standards:

All ladders shall be stored in an enclosed compartment down the right side of the water tank and below the hose bed area.

-one (1) 10 ft. collapsible, Model FL-10

-one (1) 14 ft. roof, Model PRL-14

-one (1) 24 ft. extension, Model PEL-24

## **PIKE POLE, 6'**

Two (2) pike pole 6' long with a I beam Nupla fiberglass handle shall be provided and located in the ladder storage area.

### **PIKE POLE, 10'**

Two (2) pike poles, 10' long with a I beam Nupla fiberglass handle shall be provided and located in the ladder storage area.

### **PIKE POLE STORAGE**

Aluminum tubing shall be used for the storage of four (4) pike poles and shall be located in the ladder storage area. These tubes shall be labeled as to the length of the poles stored in each tube. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate shall be provided.

### **PUMP**

Pump shall be a Waterous CMUY, 1500 gpm, two (2) stage midship mounted centrifugal type.

Pump shall be the class "A" type.

Pump shall deliver the percentage of rated discharge at pressure indicated below:

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

Pump body shall be close-grained gray iron, bronze fitted, and must be horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

Pump shall be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves shall be bolted together on a single horizontal face, to minimize chance of leakage and facilitate ease of reassemble. No end flanges may be used.

Discharge manifold of the pump shall be cast as an integral part of the pump body assembly, and shall provide a minimum of three (3) 3.50" openings, for flexibility in providing various discharge outlets for maximum efficiency.

The 3.5" openings shall be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft shall be stainless steel accurately ground to size, and supported at each end by oil or grease lubricated, anti-friction ball bearings, for rigid precise support. Impeller shall have flame plated hubs assuring maximum pump life and efficiency, despite any presence of abrasive matter in the water supply.

Bearings shall be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings shall be used.



Lantern rings shall be located at the inner ends of the stuffing boxes, to avoid having to remove them when replacing pump packing.

Wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

All test ports necessary for service testing of pump shall be centrally located on the outside of the pump panel on the drivers side of the apparatus without have to open or remove panels.

Pump shall be supplied with standard pump packing gland water seals.

Pump shall be supplied with replaceable anodes to inhibit corrosion, these are in **addition** to the standard intake screens.

### **PUMP TRANSMISSION**

Pump transmission shall be made of a three (3) piece, high tensile gray iron, horizontally split casing. Power transfer to pump shall be through a pressure lubricated, Morse HY-VO drive chain.

Drive shafts shall be a minimum of 2.35" diameter hardened and ground alloy steel. All shafts shall be ball bearing supported. The case shall be designed as to eliminate the need for water cooling.

### **AIR PUMP SHIFT**

Pump shift engagement shall be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab.

A manual back-up shift control shall also be located on the drivers side pump panel.

Two (2) indicator lights shall be provided adjacent to the pump shift inside the cab. One (1) green light shall indicate the pump shift has been completed and be labeled "pump engaged". The second green light shall indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light shall be labeled "OK to pump".

Another green indicator light shall be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light shall be labeled "Warning: Do not open throttle unless light is on".

### **TRANSMISSION LOCK-UP**

The direct gear transmission lock-up for the fire pump operation shall engage automatically when the pump shift control, in the cab, is activated.

### **AUXILIARY COOLING SYSTEM**

A supplementary heat exchange cooling system shall be provided to allow the use of water from the discharge side of the pump for cooling the engine water. Heat exchanger shall be cylindrical type and shall be a separate unit. It shall be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger shall be plumbed to the master drain valve. Engine water lines shall be run inside plastic conduit.

### **TRANSFER VALVE**

Transfer valve design shall be of the latest ball type, of all bronze construction and incorporate a hydraulically balanced seal assembly, minimizing leakage around the ball and assuring maximum pump efficiency.

Transfer valve shall operate smoothly and without sticking, even when exposed to sandy or dirty water.

Transfer valve shall be electrically operated with a manual backup.

Transfer valve shall have the ability to change from series (pressure) operation to parallel (volume) operation without reducing the operating speed of the engine regardless of the operating pressure of the pump, thus maintaining an effective fire stream at the nozzle at all times.

### **INTAKE RELIEF VALVE (internal)**

An Elkhart relief valve will be installed on the suction side of the pump preset at 125 psig. Relief valve will have a working range of 75 psig to 250 psig.

An outlet will terminate below the frame rails with a 2.50" NST hose thread adapter and will have a "Do Not Cap" warning tag.

Control of the valve will be located behind an access door at the right (passenger's) side pump panel.

### **INTAKE RELIEF VALVE (external)**

Two Akron relief valves shall be installed on the suction sides of the pump preset at 125 psig.

Relief valves shall have a working range of 75 psig to 250 psig.

\*\*\*\*\* (Akron piston intake relief valve model 7980.) to maintain consistency with other units in fleet.

Note to the builder: No drain or control valves shall be located directly below the main pump inlets that can be blocked by the intake relief valves or prevent it from moving 45 degrees left or right.

## **DISCHARGE PRESSURE RELIEF VALVE**

Shall be a Waterous Pressure Relief Valve system.

## **PRIMER**

A rotary vane, 12 volt electric powered priming system with a Waterous PrimeSafe lubrication system shall be furnished on the apparatus.

All rotating parts of the pump shall be made of corrosion resistant aluminum, stainless steel, and laminated phenolic.

Pump cylinder shall be made of aluminum alloy, hard anodized and Teflon coated for corrosion resistance and long life.

A push-pull control located at the pump control panel shall operate a combination manual/electric priming valve. This valve shall utilize a switch arrangement so that as the valve is manually opened, a plunger closes the switch and the primer motor is energized.

When dry, the pump system shall be capable of taking suction and discharging water, with a lift of 10 feet in not more than 45 seconds, through 20 feet of hard suction hose (of the appropriate size) for drafting the rated capacity of the pump.

The complete primer unit shall be fabricated by the manufacturer of the fire pump.

## **RECIRCULATING LINE, WITH CHECK VALVE**

A .50" diameter recirculating line, from the pump to the water tank, shall be furnished with a control installed at the pump operator's control panel. A check valve shall be provided in this line to prevent the back flow of water from the tank to the pump if the valve is left in the open position.

## **PUMP WARRANTY**

A Waterous **two (2) year** warranty on the parts and labor shall be provided for the pump.

## **PUMP MANUALS**

Two (2) pump manuals from the pump manufacturer shall be furnished with the apparatus. Manuals shall cover pump operation, maintenance, and parts.

## **PUMP TEST**

The pump shall be tested, approved and certified by an independent third party testing agency at the manufacturer's expense. The test results along with the pump manufacturer's certification of hydrostatic test, the engine manufacturer's certified brake horse power curve and the manufacturer's record of pump construction details shall be forwarded to the Fire Department.

## **PLUMBING**

All inlet and outlet lines up to 3.00" shall be stainless steel or synthetic rubber hose reinforced with hi-tensile polyester braid. If hose is used, it must have a minimum burst rating of 1,000 psi and be equipped with high pressure brass or stainless steel couplings.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping shall be equipped with victaulic or rubber couplings.

All lines to drain through either a master drain valve or shall be equipped with individual drain valves. All individual drain lines for discharges shall be extended with a hose to drain below the chassis frame.

All water carrying gauge lines shall be of flexible polypropylene tubing.

## **MAIN PUMP INLETS**

A 6.00" pump manifold inlet shall be provided on each side of the vehicle. The suction inlets shall include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

The main pump inlets shall have National Standard Threads.

## **SHORT SUCTION TUBE**

The suction tubes on the midship pump shall have "short" suction tubes to allow for installation of adapters without excessive overhang.

## **VALVES**

Akron 8000 stainless steel ball valves shall be used for the side 2.50" discharges. All remaining ball valves shall be Akron swing out valves.

The Akron valves shall have a solid bronze ball that is chromium plated for a hard, durable surface. The spring loaded floating seal assembly shall require no adjustment, yet provides a tight seal against both pressure and vacuum pressures.

## **INLET (Left side)**

On the left side pump panel shall be one (1) - 2.50" auxiliary suction, terminating in 2.50" National Standard Hose Thread. The auxiliary suction shall be provided with a strainer, chrome swivel and cap.

The location of the valve for the auxiliary suction shall be behind the pump panel.

## **INLET CONTROL**

Control for the side auxiliary inlet(s) shall be located at the inlet valve.

### **INLET BLEEDER VALVE**

A .75" ball type bleeder valve shall be provided for each side gated inlet. The valves shall be located behind the panel with a hand wheel type knob for the control extended to the outside of the panel. The water, which is discharged by the valve, shall be routed below the chassis frame rails.

### **TANK TO PUMP**

Booster tank shall be connected to the intake side of the pump with heavy duty 3.00" piping and a 1/4 turn 3.00" full flow line valve with the control remotely located at the operator's panel. A rubber coupling shall be included in this line to prevent damage from vibration or chassis flexing.

A check valve shall be provided in the tank to pump water supply line to prevent the possibility of "back filling" the water tank which can damage the tank.

### **TANK REFILL / RECIRCULATING**

A 2" combination tank refill and pump bypass line shall be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

### **DISCHARGE OUTLETS (Left Side)**

There shall be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

### **DISCHARGE OUTLETS (Right Side)**

There shall be one (1) discharge outlet 2.50" valve on the right side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

### **DISCHARGE OUTLETS (Rear)**

There shall be two (2) discharge outlets with a 2.50" valve on the left side bulk head of the hose bed area of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

### **DISCHARGE OUTLET, 4.00"**

There shall be two (1) 3.00" discharge outlet with a 3.00" Akron valve installed on the right side of the apparatus, terminating with a 3.00" National Standard Hose thread adapter. These discharge outlets shall be actuated with hand wheels control at the pump operator's control panel. An indicator shall be provided to show the valves position.

### **DELUGE RISER**

A 3.00" deluge riser shall be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping shall be installed securely so no movement develops when the line is charged. The riser shall be gated and controlled at the pump operator's panel. The outlet shall include an Akron valve with a hand wheel control at the pump operators panel and a ¼ turn Akron slow close valve at the base of

the deluge gun. There shall be a drain line and valve provided between the waterway control valves.

### **DISCHARGE CAPS**

Chrome plated, rocker lug, caps with chains shall be furnished for all side discharge outlets.

### **OUTLET BLEEDERS**

A .75", quarter turn type, bleeder valve shall be provided for each outlet 1.50" or larger discharge.

The valves shall be located behind the panel with a hand wheel type control extended to the outside of the side pump panel. Bleeders shall be located in a horizontal line at the bottom of the pump panel. They shall be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders shall be routed below the chassis frame rails.

**There shall be no bleeder valves below the 6" intake to interfere with the intake relief valves.**

### **ELBOWS, LEFT SIDE OUTLETS**

The 2.50" discharge outlets, located on the left side pump panel, shall be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow and cap.

### **ELBOW, RIGHT SIDE OUTLET**

The 2.50" discharge outlet, located on the right side pump panel, shall be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow and cap.

### **ELBOWS, REAR OUTLETS**

The 2.50" discharge outlets, located on the rear, shall be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow and cap.

### **ELBOWS, 3.00" OUTLET**

The 3.00" outlet shall be furnished with 3.00"(F) National Standard hose thread x 5.00" Storz elbow adapters with Storz caps.

### **DISCHARGE OUTLET CONTROLS**

The discharge outlets shall incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism shall indicate the position of the valve or an indicator shall be provided to show when the valve is closed.

### **SPEED LAY HOSE BEDS**

Two (2) speed lays with 1.50" outlets shall be provided forward of the pump house. Each bed to be capable of carrying 200 feet of 1.75" double jacketed hose and shall be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

Outlets to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The speed lay controls shall be at the pump operator's panel.

Stainless steel vertical scuff plates shall be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) shall also be equipped with a stainless steel scuff plate and roller.

Speed lay bed shall consist of removable trays for loading.

### **SPEED LAY HOSE BEDS**

One (1) speed lay bed above the two 1.75" shall be provided. The bed is to be capable of carrying 400 feet of 2.50" double jacketed hose as a dead load.

Stainless steel vertical scuff plates shall be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) shall also be equipped with a stainless steel scuff plate.

This speed lay will be provided with an aluminum tread plate hinged cover.

Any space below the speed lays and above the running board shall be incorporated into a storage compartment with an aluminum tread plate door.

### **BOOSTER REEL**

One (1) 1" booster reel with a capacity of 150 ft. of ¾" hose will be installed at a location to be determined by the manufacturer and the fire department.

The reel will be equipped with 150 ft. of ¾" standard Niedner booster hose, an Akron Model # 1702P fog nozzle, and nozzle holder mounted at the fire dept. discretion.

### **FOAM SYSTEM**

A foam proportioning system will be provided that is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class "A" & "B" foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation will be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system will automatically balance and proportion foam solution at rates from 0.1% to 9.9% regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system will allow operation from draft, hydrant, or relay operation. This will provide a versatile system to meet the demands at a fire.

## **SYSTEM CAPACITY**

The system will have the ability to deliver the following minimum foam solution flow rates at accuracies that meet or exceed NFPA requirements at a pump rating of 250 PSI.

160 GPM @ 6%  
333 GPM @ 3%  
1000 GPM @ 1%

Class A foam setting in .1 % increments from .1% to 1%. Typical settings of 1%, .5% and .3% (Maximum capacity will be limited to the plumbing and water pump capacity)

## **HYDRAULIC DRIVE SYSTEM**

The foam concentrate pump will be powered by a hydraulic drive system, which is automatically activated, whenever the vehicle water pump is engaged. A system that drives the foam pump via an electric motor will not be acceptable. A large parasitic electric load used to power the foam pump can cause an overload of the chassis electrical system.

Hydraulic oil cooler will be provided to automatically prevent overheating of the hydraulic oil, which is detrimental to system components. The oil/water cooler will be designed to allow continuous system operation without allowing hydraulic oil temperature to exceed the oil specifications.

The hydraulic oil reservoir will be of four (4) gallons minimum capacity and will also be of sufficient size to minimize foaming and be located to facilitate checking oil level or adding oil without spillage or the need to remove access panels.

## **CONTROL SYSTEM**

The system will be equipped with a digital electronic control display located on the pump operators panel. Push button controls will be integrated into the panel to turn the system on/off, control the foam percentage, direct which foam to use on a multi-tank system, and to set the operation modes (automatic, manual, draft, calibration, or flush).

The percent of injection will have presets for class A and class B foam. These presets can be changed at the fire department as desired. The percent of injection will be able to be easily changed at the scene to adjust to changing demands.

In order to minimize the use of abbreviations and interpretations, system information will be displayed on the panel by way of .50 tall LEDs that total fourteen characters (two lines of 7 each). System on and foam pump on indicator lights will also be included. Information displayed will include mode of operation (automatic, manual, draft, calibration, or flush), foam supply selected (Class A or Class B), water total, foam total, foam percentage, remaining gallons, and time remaining.

The control display will direct a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor will compare the values of the water flow versus the position/rate of the



foam pump, to ensure the proportion rate is accurate. One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump.

The foam concentrate pump will be of positive displacement, self-priming; linear actuated design, driven by the hydraulic motor. The pump will be constructed of brass body; chrome plated stainless steel shaft, with a stainless steel piston. In order to increase longevity of the pump, no aluminum will be present in its construction.

A relief system will be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump

The foam concentrate pump will have minimum capacity for 10 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system will deliver only the amount of foam concentrate flow required, without re-circulating foam back to the storage tank. Re-circulating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump will be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.

An external foam pick-up will be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up will be designed to allow continued operation after the on-board foam tank is empty. The external foam pick-up will be designed to allow use with training foam or colored water for training purposes.

The external foam pick-up will be one (1) - 1.00" female swivel connection with chrome-plated plug and chain will be located on the driver's side pump panel. A check valve will be installed in the external connection.

A 1.00" flexible tube with 1.00" male NST thread will be provided and shipped loose.

The foam system pump will be used to fill the foam tank. This will allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch will be installed in the fill dome to shut the system down when the tank is full. A warning message will be displayed on the proportioner control to advise the operator of the proper foam for the tank. This system will eliminate the need to climb up to the top of the truck with foam pails.

### **FLUSH SYSTEM**

The system will be designed such that a flush mode will be provided to allow the system to flush all foam concentrate with clear water. The flush circuit control logic will ensure the foam tank supply valve is closed prior to opening the flush valve. The flush valve will be operated at the foam system control head for ease of operation. The valve will be electrically controlled and located as close to the foam tank supply valve as possible. A manual flush drain valve will be labeled and located under the drivers' side running board.

## **PUMP COMPARTMENT**

The pump compartment shall be separate from the hose body and compartments so that each may flex independently of the other. It shall be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment shall be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels shall be removable from the chassis in a single assembly.

## **PUMP COMPARTMENT LIGHT**

Two (2) 6.00" diameter Truck-Lite, model 79384, light/s shall be provided inside the right and left side pump enclosure and accessible through a door on the pump panel. A .125" weep hole shall be provided in each light lens, preventing moisture retention.

## **PUMP MOUNTING**

Pump shall be mounted to a substructure, which shall be mounted to the chassis frame rail using rubber isolators. The mounting shall allow chassis frame rails to flex independently without damage to the fire pump.

## **PUMP CONTROL PANELS (Side Control)**

All pump controls and gauges shall be located at the left (driver's) side of the apparatus and properly marked.

The pump panel on the right (passenger's) side shall be removable with lift and turn type fasteners. The left (driver's) side shall be removable with lift and turn type fasteners.

The gauge and control panels shall be two (2) separate panels for ease of maintenance.

The gauge panel shall be hinged at the bottom with a full length stainless steel hinge. The fasteners used to hold the panel in the upright position shall be quarter-turn type. Vinyl covered cable or chains shall be used to hold the gauge panel in the dropped position.

Polished stainless steel trim collars shall be installed around all inlets and outlets.

All push/pull discharge controls shall have stainless steel rods with a diameter of .50". The control rods shall pull straight out of the panel. The remote push/pull control rods shall be equipped with universal joints to eliminate binding. Guides for the push/pull control rods shall be chrome plated castings securely mounted to the pump panel.

Identification tags for the discharge controls shall be located directly above the control handle and recessed within the same casting as the guide.

All line pressure gauges shall be mounted in individual chrome plated castings with the identification tag recessed in the casting below the gauge. All remaining identification tags shall be mounted on the pump panel in chrome plated bezels. Mounting of the castings and identification bezels shall be done with a threaded peg cast on the back side of the bezel or screws.

The lay out of the pump panel regarding the location of control levers and gauges will be as approved by the fire department.

There shall be a water tight compartment with door provided, located in master gauge area of the pump panel for a remote radio head control and speaker.

### **PUMP AND GAUGE PANEL**

The pump and gauge panels shall be constructed of black vinyl covered aluminum, to allow easy identification of the gauges and controls and to eliminate glare.

The black vinyl shall be bonded to the aluminum, by the company that supplies the product.

A polished aluminum trim molding shall be provided on both sides of the pump panel.

The gauge panel shall be hinged, at the bottom, with a full length stainless steel hinge. The fasteners that hold the panel, in the up right position, shall be quarter-turn style. Vinyl covered chains shall be used to hold the panel in the dropped position.

The passenger's side pump panel shall be removable and fastened with quarter-turn fasteners.

### **PUMP PANEL CONTROLS**

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

- Engine Oil Pressure: With visual and audible warning
- Engine Water Temperature: With visual and audible warning
- Transmission Oil Temperature: With visual and audible warning
- Voltmeter: Two (2) stage low or high voltage warning indicator light with and audible alarm
- Fuel Message: Two (2) stage low fuel warning indicator light (amber) with and audible alarm
- Tachometer: digital display

- Pump Hour Meter:
- Engine Hour Meter:
- Stop Engine Warning Indicator Light: Red with audible alarm
- Check Engine Warning Indicator Light: Amber with audible alarm

Also provided at the pump panel shall be the following:

- Master Pump Drain Control
- High Engine Temperature/Low Coolant Indicator Light
- Stop Engine Warning Indicator Light
- Check Engine Warning Indicator Light

#### **PUMP OVERHEAT INDICATOR LIGHT**

A pump overheat indicator light, manufactured by M.C. Products, shall be installed at the pump operator's panel with no exceptions.

#### **AIR HORN BUTTON**

An air horn control button in red will be provided at the pump panel. This button will be properly labeled and put within easy reach of the operator.

#### **COLOR CODED NAME TAGS**

All outlet discharges shall have color coded name tags, with each discharge having its own color. These tags shall be used for labeling the discharge pressure gauges, controls, outlets, drains and the pump RPM test port.

#### **GAUGES, VACUUM and PRESSURE**

The pump vacuum and pressure gauges shall be silicone filled and manufactured by Class 1, Inc with no exceptions.

The gauges shall be a minimum of 6" in diameter and shall have white faces with black lettering, with a pressure range of 30.00"-0-600#.

The pump pressure and vacuum gauges shall be installed adjacent to each other at the pump operator's control panel.

## **PRESSURE GAUGES**

The individual "line" pressure gauges for the discharges shall be interlube filled and manufactured by Class 1 with no exceptions.

They shall be a minimum of 3" in diameter and shall have white faces with black lettering.

Gauges shall be compound type with a vacuum/pressure range of 30.00"-0-400#.

The individual pressure gauge shall be installed as close to the outlet control as practical.

## **WATER LEVEL GAUGE**

An electric water level gauge manufactured by M.C. Products, Quint 5 water level gauge shall be provided on the operator's panel. The gauge shall register water level by means of five (5) brightly colored incandescent lights. The water level indicators shall be as follows:

- Full = Green
- 3/4 = Yellow
- 1/2 = Yellow
- 1/4 = Yellow
- Refill = Red

To further alert the pump operator, the refill light shall start flashing when the water level drops below the 1/4 mark.

## **STEP / LIGHT SHIELD**

Illumination shall be provided for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it. External illumination shall be a minimum of 5 foot-candles on the face of the device. Internal illumination shall be a minimum of 4 foot lamberts.

Lights shall be installed under a aluminum tread plate step. One pump panel light shall come on at the operator's panel when the pump is shifted into gear from inside the cab. This is to afford the operator some illumination when first approaching the control panel. The remaining lights to be actuated from a switch located on the pump panel.

An additional Step / Light shield shall be provided above passenger's side pump panel. The pump panel shall be illuminated by incandescent lights installed under the step / light shield.

The lights shall be operated from a switch on the pump panel.

Each light shall have a .125" hole in the lens to prevent moisture retention.

## **ELECTRICAL**

All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All wiring shall be high temperature crosslink type. Wiring shall be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic or manual reset circuit breakers shall be provided which conform to SAE Standards. Wiring shall be color, function and number coded. Function and number codes shall be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:

(1) All holes made in the roof shall be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.

(2) Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.

(3) Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws shall be used in mounting these devices. Also a coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.

(4) Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug).

(5) All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

(6) All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal. Identification of the switches shall be done by either printing or etching on the switch panel. The switches and identification shall be illuminated.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, shall be furnished. Rear identification lights shall be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads shall be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests shall be recorded and provided to the purchaser at time of delivery.

### **REAR FMVSS LIGHTING**

A pair of Whelen, Model CAST4V LED, four (4) lamp modules shall be provided. Each module shall include a red LED warning light, stop-tail light, sequential directional lights and backup light mounted in a polished aluminum housing.

The lights shall be mounted on the face of the rear body compartments.

One (1) Whelen 60R00XRR Red LED light shall be located as high as possible in the center rear of the apparatus. This light will activate with the brake lights for additional warning. The light shall be provided with a Whelen, Model 6EFLANGE, trim bezel.

Four (4) red reflectors shall be provided.

A Weldon, Model 23882-2600-00 license plate bracket shall be mounted on the driver's side above the warning lights. A Weldon, Model 9186-23882-30, step lamp shall illuminate the license plate.

### **COMPARTMENT LIGHTING**

LED rope style lighting shall be provided in each enclosed compartment down each side of the door opening.

Opening the compartment door shall automatically turn compartment lighting on.

### **PERIMETER SCENE LIGHTS, CAB**

There shall be a Truck-Lite, model 40003, 4.00" grommet mount weatherproof light provided for each cab door. Lighting shall be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which shall be activated automatically when the exit doors are opened, by the door jam switch and by the same means as the body perimeter lights.

The lighting shall be capable of providing illumination at a minimum level of one (1) foot-candle on ground areas within 30.00" of the edge of the apparatus in areas which personnel climb in or out of the apparatus or descend from the apparatus to the ground level.

### **PERIMETER SCENE LIGHTS, BODY**

There shall be a total of six (6) Truck-Lite, model 40003, 4.00" grommet mount weatherproof lights provided on the apparatus. Four (4) lights shall be provided under the rear step area and two (2) lights shall be provided under the pump panel running boards. The lights shall be spaced two (2) each side of apparatus and two (2) shall be facing to the rear with clear lens. The perimeter scene lights shall be activated by a parking brake control and transmission reverse activation.

The lighting shall be capable of providing illumination at a minimum level of one (1) foot-candle on ground areas within 30.00" of the edge of the apparatus in areas

designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level.

### **PERIMETER SCENE LIGHTS, CAB**

Two (2)-600 series Whelen work lights with an angle bracket shall be mounted one on each side of the cab between the two cab doors. The lights shall be furnished with a halogen flood bulb. These lights shall be controlled from a switch mounted in the cab.

### **WORK LIGHTS**

Two (2)-600 series Whelen work lights with an angle bracket shall be provided at the rear of the apparatus. The lights shall be furnished with a halogen flood bulb. The work lights shall be switched on with pump panel lights and they shall activate with the reverse/backup lighting

### **DECK LIGHTS**

Two (2) 6.00" Unity deck lights shall be provided at the rear of the apparatus to provide light into the hose bed for hose loading.

### **HAND HELD SPOTLIGHT**

A Specialty Lighting, model 2150-1, hand held spotlight shall be installed in the cab officer's side. The light shall be furnished with the 9.00 feet of coil cord.

### **AIR HORN SYSTEM**

Two (2) Grover air horns shall be provided and located, in the front bumper, recessed outboard of frame rails. The horn system shall be piped to the air brake system wet tank utilizing .38" tubing. A pressure protection valve shall be installed in-line to prevent the loss of air, in the air brake system.

### **AIR HORN CONTROL**

The air horns shall be actuated by two (2) toe switches, one on officer side engine tunnel, one on driver's side in floor board. The driver shall have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

Power to the toe switches shall be provided through the Emergency Master electrical control switch. This is to prevent accidental activation except when the apparatus warning system is being used.

### **ELECTRONIC SIREN**

A "Code 3", model 3692, electronic siren with noise canceling microphone shall be provided.

Siren head shall be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket shall be capable of rotating a minimum of 180 degrees.



### **SPEAKER**

There shall be one (2) speakers provided recessed outboard of frame rails in the bumper extension. Each speaker shall be a Cast Products SA2400 100-watt speaker. Each speaker shall be connected to the siren amplifier.

### **MECHANICAL SIREN**

A Federal Q2B siren shall be furnished. A siren brake button shall be installed on the switch panel.

The mechanical siren shall be mounted on the bumper deck plate. It shall be mounted on the left side. The siren mounting shall include a reinforcement plate and shall not interfere with tilting of cab.

The siren shall also be furnished with a sound deflecting hood to reflect the sound forward of the apparatus.

### **SWITCHES, MECHANICAL SIREN**

The mechanical siren shall be actuated by two (2) toe switches located on the driver's side and officer's side engine tunnel of cab.

Power to the toe switches shall be provided through the Emergency Master electrical control switch. This is to prevent accidental activation except when the apparatus warning system is being used.

### **WARNING LIGHT (Cab Roof)**

One (1) Whelen Edge Ultra Freedom LED 9310NLED lightbar shall be mounted on the cab roof. The light bar shall be 77" wide

The lightbar will include the following:

- Two (2) red flashing forward facing LED modules.
- Two (2) clear flashing forward facing LED modules.
- Two (2) red flashing front corner LED modules.
- One (1) red flashing driver side facing LED module.
- One (1) red flashing officer side facing LED module.
- All the lenses will be clear.

### **LIGHTS, FRONT ZONE LOWER**

Two (2) pair of Whelen, model 60R00FRR LED Warning lights shall be provided with red lenses. The warning lights will be housed in the same common bezel as the directional lights and be located above the headlights.

A switch will be provided on the cab instrument panel for activating the warning lights.

### **INTERIOR CAB DOOR WARNING LIGHTS**

Four (4) flush mounted, 4.00" diameter round, flashing lights shall be provided. One (1) light shall be located inside of each cab and crew cab door pan. Each light shall be activated by the door jam switch of the associated door. The color of the lights shall be amber.

### **SIDE ZONE LOWER LIGHTING**

Whelen, Model 60R00FRR LED lights with the 6EFLANGE shall be located at the following positions:

- Front bumper extension - one (1) each side. (red)
- Side of cab N/A (midship) - one (1) each side. (amber)
- Rear fender panel of the apparatus N/A - one (1) each side. (red)

The above six (6) lights shall be required to meet the lower level optical warning and optical power requirements of NFPA.

The lights shall be controlled by a lighted switch on the cab instrument panel.

### **REAR ZONE LOWER LIGHTING**

Two (2) Whelen 60R00FRR RED LED lights shall be located inside the stop/tail light housing at the rear of the apparatus required to meet the lower level optical warning and optical power requirements of NFPA.

### **REAR ZONE UPPER LIGHTING**

Two (2) Whelen B6TS Combination Tailboard lights with a Red rotating halogen beacon and red LED shall be provided on the upper rear area of the compartments in order to meet the requirements of NFPA.

### **Whelen Traffic Advisor Arrow Stick**

An (LED) Arrow Stick shall be installed on the rear of the apparatus 64.00" above the ground.

An enclosed slot on the rear of the truck shall be provided for protection of the Arrow Stick.

The control head shall be mounted in the cab as to where the driver can reach and control the operation of the light.

The arrow stick shall operate in the flash mode when the emergency warning lights are turned on for additional rear warning.

### **WARNING LIGHT TEST SWITCH**

A switch shall be provided to test white warning lights that are deactivated by the engagement of the park brake.

### **ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT**

The following guidelines shall apply to the 120/240 VAC system installation:

#### **General**

Any fixed line voltage power source producing alternating current (ac) line voltage shall produce electric power at 60 cycles plus or minus 5 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.

#### **Grounding**

Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding.

An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor, properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

## **Operation**

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

Provisions shall be made for quickly and easily placing the power source into operation. The control shall be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train shall be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label shall be permanently attached to the apparatus near the operator's control station.

Direct drive (PTO) and portable generator installations shall comply with Article 445 (Generators) of the NEC.

## **Overcurrent protection**

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144 inches. (3658 mm) in length.

For fixed power supplies, all conductors in the power supply assembly shall be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

## **Wiring Methods**

Fixed wiring systems shall be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
- or
- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring shall be run as follows.

- Separated by a minimum of 12 inches (305 mm), or properly shielded, from exhaust piping

- Separated from fuel lines by a minimum of six (6) inches (152 mm) distance.

Electrical cord or conduit shall be supported within six (6) inches (152 mm) of any junction box and at a minimum of every 24 inches (610 mm) of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

#### Wiring Identification

All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size.

#### Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location shall be not less than 24 inches (610 mm) from the ground. Receptacles on off-road vehicles shall be a minimum of 30 inches (762 mm) from the ground.

The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.

#### Dry Locations

All receptacles located in a dry location shall be of the grounding type. Receptacles shall be not less than 30 inches (762 mm) above the interior floor height.

All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they shall be so marked.

#### Listing

All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service.

#### Electrical System Testing

The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test shall be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test shall be conducted after all body work has been completed.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

#### Operational Test per NFPA 1901 Chapter 19-14.4

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The prime mover shall be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source shall be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in NFPA 1901 chapter 19-14.5.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in NFPA 1901 Chapter 9 shall be applied to the low voltage electrical system during the operational test.

### **GENERATOR**

The apparatus shall be equipped with a complete electrical power system. The generator shall be a 8 KW Harrison Hotshift PTO/Hydraulic unit. The wiring and generator installation shall conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation shall be designed for continuous operation without overheating and undue stress on components.

#### Generator Performance

- Continuous Duty Rating: 8,000 watts
- Nominal Volts: 120/240
- Amperage: 50 @ 120volts, 25 @ 240 volts
- Phase: Single
- Cycles: 60 hertz

- Engine Speed at Engagement: Idle
- RPM range: 600 to 3,300

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 utilize the main chassis transmission to power the generator. The generator shall be driven by an engine transmission power take off unit, through a hydraulic pump and motor.

The generator shall be operable in the stationary mode with an electrical control inside the cab with a pilot light to note engagement. The hydraulic engagement supply shall be activated only after the chassis parking brake control is in the "park" position and the transmission is in the neutral position.

An electric/hydraulic valve shall supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

The generator hydraulic circuit shall include a soft start valve to protect the generator components during PTO engagement.

#### Generator Instruments and Controls

To properly monitor the generator performance a digital meter panel shall be furnished and mounted next to the circuit breaker panel. The meter shall indicate the following items:

- Voltage
- Amperage for both lines
- Frequency
- Generator run hours
- Over current indication
- Over temperature indication
- Service required indication
- "PTO" engagement indication

- "Power On" indication
- Two (2) fuse holders with two (2) amp fuses (for indicator light protection)

The meter and indicators shall be installed near eye level in the compartment. Instruments shall be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used shall be accurate within +/- Two (2) percent.

#### Generator Wiring

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage. The following electrical components shall be the minimum acceptable quality standards for this apparatus:

#### Wiring:

All electrical wiring shall be fine stranded copper S.O. type. The wire shall be sized to the load and circuit breaker rating; ten (10) gauge on 30 amp circuits, 12 gauge on 20 amp circuits and 14 gauge on 15 amp circuits. The S.O. cable shall be run in corner areas and extruded aluminum pathways built into the body for easy access.

#### Load Center:

The main load center shall be Square D with circuit breakers rated to load demand.

#### Circuit Breakers:

Individual breakers shall be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment.

### **GENERATOR LOCATION**

The generator shall be mounted in the above pump in cargo area. The flooring in this area shall be either reinforced or constructed, in such a manner, that it shall handle the additional weight of the generator.

### **GENERATOR START**

A switch shall be located on the cab instrument panel and a switch shall be located on the pump panel to engage the generator PTO and field.



### **CIRCUIT BREAKER PANEL**

The circuit breaker panel shall be located in a compartment best accessible for the engineer on the drivers side, pump panel area.

### **120 VOLT LIGHTING APPRATUS BODY**

The apparatus body shall have two (2) FRC optimum 750 watt 120 volt, portable lights (OPA700-S75) on each side of the upper rear part of the body. These lights shall be controlled at the breaker panel.

Two (2) telescoping bottom raise lights mounted to the rear of the cab. FRC optimum 750 watt 120 volt, (OPA530-S75) These lights shall be controlled at the breaker panel.

One (1) light shall be mounted on the front of the cab brow. FRC optimum 750 watt 120 volt, (OPA851-S75) This light shall be controlled at two locations, one at the breaker panel and one at the officer switch panel.

### **120 VOLT RECEPTACLE**

There shall be four (4) 20 amp 120-volt receptacles with twist lock polarized plugs mounted in the rear wheel well fender and the upper rear section of the body, two on each side of the apparatus for a total of four (4).

These receptacles shall have a weather tight cover plate and shall be labeled **120-volt / 20 Amp receptacle**.

No less than four (4) polarized male adapters shall be provided loose with the truck.

### **220 VOLT RECEPTACLE**

There shall be one (1) 30 amp 220-volt receptacles with twist lock polarized plugs mounted in the location requested by the fire department

### **120 VOLT CORD REELS**

There shall be two (2) 120-volt cord reels with 250' of 10/3 yellow cable and twist lock polarized 20 amp plugs.

Each reel shall be enclosed into the rear compartments of the body on each side of the apparatus. There shall be an opening in the enclosure to allow the cable to pass through. The plug shall be held in a clip on the side of the apparatus body to allow easy access. An electric rewind button shall be within reach of the cord reel to allow one person to rewind the cable.

Two (2) four gang receptacle boxes with a light shall be provided with a mounting box in the body of the truck. It shall also have two (2) 20 amp twist lock polarized plugs and two (2) 15 amp duplex plugs.

## **PAINT**

The exterior custom cab and body painting procedure shall consist of a six (6) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body shall be thoroughly cleaned and prepared for painting. Surfaces that shall not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum tread plate. Each imperfection on the exterior metal surface shall be removed or filled and then sanded smooth for a smooth appearance. All seams shall be sealed before painting.
2. Chemical Cleaning and Treatment - The metal surfaces shall be properly cleaned using a high pressure and high temperature acid etching system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra pure water final rinse shall be applied to all metal surfaces, excluding undercarriage components, at the conclusion of the metal treatment process.
3. Primer/Surfacer Coats - A two (2) component urethane primer/surfacer shall be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface.
4. Hand Sanding - The primer/surfacer coat shall be lightly sanded to an ultra smooth finish.
5. Sealer Primer Coat - A two (2) component sealer primer coat shall be applied over the sanded primer.
6. Topcoat Paint - Two (2) coats of an automotive grade, two (2) component acrylic urethane paint and CLEAR COAT shall be applied .

All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure paint behind all mounted items. Body assemblies that can not be finish painted after assembly shall be finish painted before assembly.

The cab shall be two-tone, with the upper section painted Imron White L0006H or equivalent and lower section of the cab and body painted Imron Red 0612H or equivalent.

## **PAINT - ENVIRONMENTAL IMPACT**

Contractor shall meet or exceed all current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Controls shall include the following conditions:

- Topcoats and primers must be chrome and lead free.

- Metal treatment chemicals must be chrome free. The wastewater generated in the metal treatment process must be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations must have a 99.99% efficiency factor.
- Particulate emissions from painting operations must be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98.00%. Water wash systems must be 99.97% efficient.
- Water from water wash booths must be reused. Solids shall be removed mechanically on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.
- Empty metal paint containers must be cleaned, crushed and recycled to recover the metal.
- Solvents used in cleanup operations must be collected, sent off-site for distillation and returned for reuse. Residue from the distillation operation shall be used as fuel in off-site cement kilns.

Additionally, the finished apparatus shall not be manufactured with or contain products that have ozone depleting substances. Contractor shall, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

#### **PAINT CHASSIS FRAME ASSEMBLY**

The chassis frame assembly shall be painted job red before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that shall be painted red are frame rails, cross members, axles, suspension, steering gear, fuel tank, body substructure supports, underside area of the complete body assembly, miscellaneous mounting brackets, etc.

#### **WARRANTY - PAINT AND CORROSION**

The cab and body exterior paint finish shall be warranted against blistering, peeling, bubbling, lack of adhesion or any other manufacturing or material defect for a period of **six (6) years**.

The cab and body shall also be warranted against corrosion perforation for a period of **ten (10) years**.

A copy of the manufacturer's warranty shall be included with the bid.

### **PAINT, COMPARTMENT INTERIOR**

Interior of compartmentation shall be painted spatter gray with a clear coat.

### **REFLECTIVE STRIPES**

Three (3) white reflective stripes shall be provided along both sides of the body and across the rear of the apparatus. The reflective bands shall consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

All doors shall have a reflective chevron strip on the lower section of the inside of the door.

Refer to the enclosed photo's of other Monroe Fire trucks.

### **GOLD LEAFING AND LETTERING**

Three inch (3") gold leafing and lettering without lining and shading and two (2) center scrolls consistent with other fire department apparatus shall be provided on apparatus front doors. Eight (8) gold leaf corner scrolls shall be provided.

Gold leaf lettering shall also be provided on rear doors, front and rear of apparatus.

Gold leaf striping shall act as the paint break between the upper and lower paint on the cab.

Refer to the enclosed photo's of other Monroe Fire trucks.

### **LOOSE EQUIPMENT**

The following equipment shall be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit
- Four (4) extra replacement control switches

### **TRAINING**

The manufacturer of the apparatus shall provide a training engineer. The training engineer shall instruct the fire department personnel in the operation and maintenance of the apparatus for a period of not less than three (3) days.







**OPTIONS, to be listed separately from the cost of the truck**

- (1) Insta-chain system for the drive axle.
- (2) Factory training, travel and lodging for City of Monroe garage mechanic  
Covering the following
  - a. Drive line systems
  - b. Electrical systems DC & AC
  - c. Multiplex components
  - d. foam system maintenance

**INSPECTION TRIPS**

The bidder will provide two (2) factory inspection trips for combined total of six (6) customer representatives. The inspection trip will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs of transportation, lodging and meals will be the responsibility of the bidder. If the bidder's factory is more than 250 miles, the transportation will be by commercial air carrier or commercial air charter.

PICTURES OF PRESENT COM TRUCK FOR CLARIFICATION PURPOSES

PICTURE	PICTURE	PICTURE
		
Front showing hose box	Hose box Open	Side view – paint scheme
		
Driver's Door Emblem	Crew Door Emblem	Rear

**NOTE that the first page must be signed and notarized and returned included in the return bid.**

**Thank you.**

**Addendum Formal Bid Document**  
**City of Monroe**  
**Fire Department**  
**Pumper Engine Truck**  
**Opening September 20, 2007 2:00 PM**  
**Addendum One (1)**

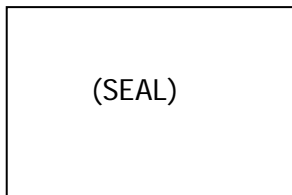
This document MUST be signed, notarized and attached to the bid documents.

I \_\_\_\_\_ have read and understand the attached bid document **Addendum One (1)** for the City of Monroe Formal Bid Pumper Engine Truck.

**IN WITNESS WHEREOF**, the undersigned has executed this instrument this \_\_\_\_\_ day of \_\_\_\_\_, YR \_\_\_\_\_.

(X) \_\_\_\_\_  
Full Signature of Firm Representative

Acknowledged before me, a Notary Public in and for the State of \_\_\_\_\_, County of \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, YR \_\_\_\_\_ by the above named.



\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
Address

My Commission expires: \_\_\_\_\_



## Addendum

Specifications may now be obtained via the internet at [http://www.monroenc.org/Bids\\_0.htm](http://www.monroenc.org/Bids_0.htm) or directly from email sent via e-procurement portal at ENI-NET. Changes to the posted bids may occur prior to the actual bid opening. Addenda posted on this page will be noticed by email to original company email address used for initial offering. Final bids must represent all specifications as well as all addenda issued. Any questions regarding this bid, please contact Mike Keziah, CLGPO Administrative Services Manager at 704-282-4603 or [mkeziah@monroenc.org](mailto:mkeziah@monroenc.org).

**Format:** The corrections per the pre-bid conference will be first given in total as they were originally presented under a heading of **ORIGINAL** followed by the corrected version under a heading of **CORRECTIONS WITH CORRECTIONS IN CAPITALS**. Only the items in this document are considered corrected. The remainder of the original bid document will be considered to stand as stated.

### **ORIGINAL: (ON NOTICE PAGE COVER)**

Original was copied and pasted with incorrect item being bid as well as an August opening date.

### **CORRECTION:**

The first paragraph should read:

Sealed bids will be received by the City of Monroe, North Carolina for the furnishing of a fire pumper as specified, until 2:00 PM on September 20, 2007, at the City of Monroe Operations Center, 2401 Walkup Avenue, Monroe, NC 28110, at which time the bids received electronically will be publicly opened and read aloud.

### **ORIGINAL:**

No Performance Bond mentioned.

### **CORRECTION:**

100% Performance Bond will be required of successful bidder. Bond must be issued by a surety licensed to do business in North Carolina.

### **ORIGINAL:**

#### **GENERAL CONSTRUCTION**

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

### **CORRECTION:**

#### **GENERAL CONSTRUCTION**

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association. *NOTE: Any additions or references to axle weights must/are not to be misunderstood to cause the truck to be out of balance with recommendations for balance within transmission, engine, and truck weight requirements.*

**ORIGINAL:**

**APPROVAL DRAWING**

A drawing of the proposed apparatus shall be provided with the bid document. Followed by (after the bid is awarded) an engineered drawing that will be approved by Monroe Fire Department before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.

**CORRECTION:**

**APPROVAL DRAWING**

A *CONCEPTUAL* drawing of the proposed apparatus shall be provided with the bid document. Followed by (after the bid is awarded) an engineered drawing that will be approved by Monroe Fire Department before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.

**ORIGINAL:**

**ENGINE**

A Caterpillar Diesel electronic engine as described below shall power the chassis:

Number of Cylinders: Six (6)

- Rated Brake Horsepower: 425 hp

**CORRECTION:**

**ENGINE**

A *C-13* Caterpillar Diesel electronic engine as described below shall power the chassis:

Number of Cylinders: Six (6)

- Rated Brake Horsepower: *485 hp MINIMUM*

**ORIGINAL:**

**CAB**

The cab shall be designed specifically for the fire service and manufactured by the chassis builder as a heavy duty chassis.

Construction of the cab shall be aluminum welded to extruded aluminum sub frame.

**CORRECTION:**

**CAB**

The cab shall be designed specifically for the fire service and manufactured by the chassis builder as a heavy duty chassis.

Construction of the cab shall be aluminum *OR STAINLESS STEEL* welded to extruded aluminum *OR STAINLESS STEEL* sub frame.

**ORIGINAL:**

**ADDINATIONAL SCBA MOUNTS**

**CORRECTION:**

(SPELLING ONLY) – Additional SCBA Mounts

**ORIGINAL:**

**FIRE-COM INTERCOM/ RADIO INTERFACE**

A Fire-Com **TM** 3020R intercom/radio interface system shall be installed in the cab **with** two patch cables provided to connect to two (2) Motorola mobile radios

**CORRECTION:**

**FIRE-COM INTERCOM/ RADIO INTERFACE**

A Fire-Com **TM** 3020R intercom/radio interface system shall be installed in the cab **with** two patch cables provided to connect to two (2) Motorola mobile radios *ONE RADIO IS A CDM 1250 AND THE OTHER A XTL 5000.*

**ORIGINAL:**

**HOSE BED**

The hose body shall be fabricated of .125"-5052 aluminum with a 38,000 psi tensile strength.

**CORRECTION:**

**HOSE BED**

The hose body shall be fabricated of *STAINLESS STEEL OR* .125"-5052 aluminum with a 38,000 psi tensile strength.

**ORIGINAL:**

**COMPARTMENTATION**

Compartmentation shall be fabricated of aluminum with a minimum spec of .125", 5052-H32 aluminum with a tensile strength range of 31,000 to 38,000.

**CORRECTION:**

**COMPARTMENTATION**

Compartmentation shall be fabricated of *STAINLESS STEEL OR* aluminum with a minimum spec of .125", 5052-H32 aluminum with a tensile strength range of 31,000 to 38,000.

**ORIGINAL:**

**ROLL OUT TRAYS**

There shall be three (3) roll out trays provided. The location shall be provided by the fire dept. after review of the engineer drawings.

**TOOL BOARDS**

There shall be two (2) pull out or swing out tool boards made of metal pegboard.

There shall be two (2) pegboard walls provided in the rear of two compartments located per the fire department.

**CORRECTION:**

**ROLL OUT TRAYS**

There shall be three (3) *FLOOR MOUNTED* roll out trays provided. The location shall be provided by the fire dept. after review of the engineer drawings.

**TOOL BOARDS**

There shall be ~~two (2)~~ FOUR(4) pull out ~~or swing-out~~ tool boards made of metal pegboard.

There shall be two (2) pegboard walls provided in the rear of two compartments located per the fire department.

**ORIGINAL:**

**DISCHARGE OUTLET, 4.00"**

There shall be two (1) 3.00" discharge outlet with a 3.00" Akron valve installed on the right side of the apparatus, terminating with a 3.00" National Standard Hose thread adapter. These discharge outlets shall be actuated with hand wheels control at the pump operator's control panel. An indicator shall be provided to show the valves position.

**CORRECTION:**

**DISCHARGE OUTLET, 4.00"**

There shall be ~~two~~ ONE (1) 3.00" discharge outlet with a 3.00" Akron valve installed on the right side of the apparatus, terminating with a 3.00" National Standard Hose thread adapter. These discharge outlets shall be actuated with hand wheels control at the pump operator's control panel. An indicator shall be provided to show the valves position.

**ORIGINAL:**

**LOOSE EQUIPMENT**

The following equipment shall be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit
- Four (4) extra replacement control switches

**CORRECTION:**

**LOOSE EQUIPMENT**

The following equipment shall be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit
- Four (4) extra replacement control switches
- *6" SUCTION HOSE 10 FT LIGHT WEIGHT FLEXIBLE KOCHER BRAND*

**ORIGINAL:**

**OPTIONS, to be listed separately from the cost of the truck**

(1) Insta-chain system for the drive axle.

(2) Factory training, travel and lodging for City of Monroe garage mechanic  
Covering the following  
a. Drive line systems

- b. Electrical systems DC & AC
- c. Multiplex components
- d. foam system maintenance

**CORRECTION: (ADDITIONAL LINE ADDED TO PROPOSAL SECTION OF RFQ)**

**OPTIONS, to be listed separately from the cost of the truck**

- (1) Insta-chain system for the drive axle.
- (2) Factory training, travel and lodging for City of Monroe garage mechanic  
Covering the following
  - a. Drive line systems
  - b. Electrical systems DC & AC
  - c. Multiplex components
  - d. foam system maintenance
- (3) *CHEVRON (NFPA PROPOSED) COMPLIANT STRIPPING ON REAR OF UNIT*

**END OF CORRECTIONS – ADDENDUM ONE**