WARRANTY

Seagrave Fire Apparatus, Inc., hereinafter referred to as the **Company**, warrants to the original owner that each new Seagrave fire apparatus manufactured shall be free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of delivery. The **Company's** obligation under this warranty is limited to the repair or replacement, as the **Company** may elect, of any part or parts thereof including equipment and trade accessories (except tires and tubes) supplied by the **Company**, which shall be returned to the **Company** with transportation charges prepaid and which its examination shall disclose to the **Company's** satisfaction to have been defective. Such part or parts shall be returned not later than twelve (12) months after delivery of such apparatus.

This warranty shall not apply to:

1) Normal maintenance services or adjustments, including but not limited to fuel system cleaning, wheel alignment and balancing, engine tune-up, brake inspection or adjustment, nor to the replacement of fluids, oil seals or filters.

2) Any apparatus which shall have been repaired or altered in any way outside of the **Company's** factory, so as in its judgment would affect the stability or reliability, nor which has been subjected to misuse, abuse, negligence or accident, or to any apparatus which shall have been operated at a speed exceeding the factory rated speed or loaded beyond the factory rated capacity of the components.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND OF ALL OTHER REPRESENTATIONS TO THE ORIGINAL PURCHASER AND ALL OTHER OBLIGATIONS OR LIABILITIES, INCLUDING LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, ON THE PART OF THE COMPANY. NO PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTIES OR TO ASSUME ANY OTHER LIABILITY ON THE COMPANY'S BEHALF UNLESS SUCH AUTHORIZATION IS MADE IN WRITING BY THE COMPANY.

FWD CORPORATION

FWD Corporation is engaged principally in the design and manufacture of heavy duty on-off highway all-wheel drive trucks, and **SEAGRAVE** fire-fighting apparatus, including components and service parts for all units.

Founded in Clintonville, Wisconsin in 1909, FWD Corporation is recognized as being instrumental in the development of the all-wheel drive principle. During 1963, in an effort to expand its products line, FWD Corporation acquired the operations and net assets, other than real estate, of the SEAGRAVE Corporation's Columbus (Ohio) Division, a major manufacturer of fire-fighting trucks and apparatus since 1881; production and distribution of the SEAGRAVE products

were subsequently incorporated into the Clintonville operation.

MANUFACTURING

The Company's manufacturing operation consists of producing frame and cab assemblies, sheet metal fabricating, machining, and assembling such parts with other components such as engines and transmissions, clutches, tires and electrical products purchased in finished form. Gear ratios, wheelbases, equipment and attachments are varied to meet the special requirements of individual customers. The Company also purchases castings and forgings in rough form prepared to the Company's specifications.

MARKETING

The principal product areas in which trucks are sold under the FWD trademark are for the refuse industry. Under the SEAGRAVE trademark, the Company markets custom pumpers and aerial ladder fire trucks.

SEAGRAVE FIRE APPARATUS SPECIFICATIONS
INTRODUCTION

The selection of fire apparatus is one of the most important decisions to be made by officials of any municipality or fire department.

Fire apparatus is emergency equipment used for protection of life and property in your community and it is expected to last many years.

Emergency apparatus is subject to the most vigorous types of operations and must be kept in service around the clock. You thus must be assured that parts and service will be available for the life of the apparatus.

You must be vitally concerned with the quality of the fire fighting apparatus, its components, and the dependability of the company producing the equipment.

SEAGRAVE meets all of these requirements excellently and your SEAGRAVE apparatus is produced in one of the most modern fire apparatus manufacturing facilities in the country at Clintonville, Wisconsin. The machine shops, sheet metal shops, assembly and testing departments as well as painting and plating departments are operated by men trained to SEAGRAVE quality standards and supervised by experienced managers who insist on those standards.

Final inspection prior to delivery from the factory assures a completed unit ready for first class fire fighting operation.

Engineering at SEAGRAVE is one of our most important functions. Our Engineering staff is made up of highly trained and experienced personnel dedicated to the research, design, and building of fire apparatus. SEAGRAVE uses only

the highest quality automotive components and every item used is carefully selected for its particular function and is fully engineered into the total fire fighting unit.

SEAGRAVE "the greatest name in fire apparatus", in continuous operation since 1881, has given the U.S. Fire Service many firsts through our engineering:

First spring aerial hoist
First centrifugal pump
First enclosed pumping unit
First Automatic pressure regulator
First all steel aerial ladder
First 100% hydraulic aerial ladder hoist
First safety steel canopy cab
First 3 boom aerial platform in U.S.
And many others . . . . .

Waterous pumps are standard on **SEAGRAVE** custom apparatus and **SEAGRAVE** ladder trucks feature our 100% all steel ladder.

SEAGRAVE offers the widest variety of fire apparatus available to the Fire Service.

We trust you will favorably consider our proposal. Your confidence will be rewarded by the highest quality apparatus and excellent **SEAGRAVE** service throughout its long life.

INTENT OF SPECIFICATIONS

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

Bids shall only be considered from companies which have an established reputation in the field of fire apparatus construction and have been building pumpers for a minimum of 30 years.

The chassis, cab and body to be of the Bidder's own design and manufactured in the factory of the bidder to insure parts availability and undivided warranty responsibility.

The chassis to be the "top of the line" deluxe custom model incorporating all steel design cab for strength, durability and safety.

The apparatus must be made in the continental United States, no exception.

The cab and body sheet metal shall be constructed of galvanneal or stainless steel, no exception.

Each bidder shall furnish satisfactory evidence of his ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. He shall also show that he is in a 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 to which the apparatus furnished under contract must conform.

The total price on the bidder's proposal sheet must include all items listed in the specifications. Listing any items contained in our specifications as an extra cost item will automatically be cause for rejection.

QUALITY AND WORKMANSHIP

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

The workmanship must be of the highest quality in its respective field. Special consideration shall be given to the following points: accessibility of the various components which require periodic maintenance operations, ease of operation (including both pumping and driving), and symmetrical proportions.

Constructions must be rugged and safety factors must be provided to carry loads as 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 and for repair.

PERFORMANCE TEST AND REQUIREMENTS

A road test shall be conducted with the apparatus loaded per NFPA recommendations (unless otherwise specified) and a continuous run of ten (10) miles or more shall be made 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. The apparatus when loaded shall have not less than 25% nor more than 45% of the weight on the front axle and not less than 55% nor more than 75% on the rear axle. The successful bidder shall furnish a weight certificate showing weights on front axle, rear axle, and total weight for the completed apparatus at time of delivery, with water tank full, but without personnel, equipment and hose.

A. The apparatus must 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.

B. From a steady speed of 15 mph, the vehicle shall accelerate to a true speed of 35 mph within 30 seconds without moving the gearshift lever.

C. The fully loaded vehicle 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).

D. The apparatus shall be able to maintain a speed of 20 mph on any grade up to and including 6%.

E. The service brakes shall be capable of stopping the fully loaded vehicle in 35 feet at 20 mph on level concrete highway.

F. The apparatus shall be tested and approved in accordance with NFPA standard practices.

FAILURE TO MEET TESTS

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. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the Fire Department during the above specified period with the permission of the bidder shall not constitute acceptance.

LIABILITY

The bidder, if his bid is accepted, shall defend any and all suits and assume all liability for the use of any patented process, device, or article forming a part of the apparatus or any appliance furnished under the contract.

The manufacturer must supply a minimum of two complete operation and maintenance manuals covering the completed apparatus as delivered.

Two (2)) parts manual shall also be provided for the vehicle which will include an overall (5 view) vehicle layout, keyed to service repair parts, to assist in spare parts selection and identification.

GENERAL CONSTRUCTION

The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including a filled water tank, full complement of personnel, and fire hose shall be carried without damage to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association and current standard automotive practices.

APPROVAL DRAWINGS

Two (2) sets of engineering blueprints, specifically for this apparatus, shall be provided by the manufacturer and be approved by the fire department before construction begins. Both the fire department and the manufacturer's representative shall have a copy of this drawing. It shall become part of the total contract. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing. The drawing shall show five (5) views of the vehicle (front, rear, both sides and top). The blueprints shall show the overall dimensions of the apparatus, proposed compartment sizes and features, booster tank position, and the location of all emergency warning and and worklights that are to be provided on the apparatus.

GENERAL

Chassis shall be a new, heavy-duty custom fire apparatus chassis and all standard components not specified shall be furnished.

Chassis shall be manufactured and designed by the bidder and be that manufacturer's first line custom, cab forward chassis.

The chassis shall be designed and manufactured for heavy-duty service with adequate strength and capacity for all components for the intended load to be sustained and the type of service required.

Within these categories the following specific items shall be included.

Wheelbase shall be 187".

FRAME

The chassis frame shall be built with two continuous straight steel channels bolted to seven crossmembers. The side rails shall be of heat treated R-7 carbon manganese steel measuring 10-1/4" x 3-1/2" x 3/8". Each rail shall have a section modulus of 17.7, an elastic limit of 110,000 PSI, and a resisting bending moment of 1,947,000 inch pounds. The frame rails shall have a Life Time Warranty against cracks or failure, excluding accident or abuse.

BUMPER

A heavy duty, ribbed, 10" highly polished stainless steel bumper shall be mounted to the front of the chassis. A 1/4" thick by 9-3/8" high channel with 2" flanges shall be provided directly behind the full width of the flat portion of the bumper. The bumper extension support shall be of channel construction, bolted to the chassis frame. A 3/16" aluminum diamondette gravel pan contoured to fit between the bumper and cab shall be provided.

BUMPER EXTENSION WITH CENTER HOSE WELL

A bumper extension shall be provided with a center hose well. The front of the bumper shall be located approximately 22" from the front face of the cab. The hose well shall be of adequate size to hold approximately 25' of 5" soft suction hose.

ADDITIONAL HOSE WELL

An additional open compartment shall be provided in the extended front bumper. Compartment shall be constructed of 1/8" smooth aluminum plate. Compartment shall hold approximately 100' of 1 3/4" hose.

ALUMINUM SLATS

The hose trough shall include drain holes and aluminum slats for aeration of the hose.

The front bumper shall be modified to provide for recessed air horns.

FRONT TOW HOOKS

Two (2) chrome tow hooks shall be furnished below the bumper securely attached to the bumper support.

REAR TOW LOOPS

Two (2) 3/4" thick painted rear tow loops, with a 2" ID opening shall be provided, welded to the underside of the rear step subframe.

STEERING

Ross TAS-85 integral heavy duty power steering shall be provided. The steering gear shall have a minimum ground clearance of 15". The hydraulic pump shall be gear driven. A steering wheel 20" in diameter shall be provided.

AIR PIPING

The service brake system shall be full air type. The system is to meet or exceed current FMVSS-121 requirements. Other components or accessories shall be as follows:

- Pressure protection valve
- Quick build up system
- Engine mounted, gear driven air compressor
- Sealco 110435 dual circuit brake treadle valve
- Two air pressure gauges on cab dash with indicator light and buzzer
- One (1) BW DV2 automatic drain valve on wet tank
- Manual drain valves on remaining air reservoirs
- BW AD 9 air dryer with automatic moisture ejector
- Three air reservoirs-4270 cubic inch capacity

Brake piping shall consist of SAE approved, DOT rated, "Synflex" reinforced nylon tubing. Braided hoses shall provide flexibility between axle and frame connections. A combination of flexible stainless steel braided Teflon hose and copper line shall be provided from the compressor to the air dryer and primary tank.

The parking brake system is to be the spring set type operated by control valve on driver's console. A brake indicator light shall also be provided.

Air Dryer to have a heated automatic moisture ejector.

AUXILIARY AIR OUTLET

There shall be a 1/4" female air outlet with Schrader air hose fitting mounted on the left pump panel with a 1/4" valve. The outlet shall be connected to one of the vehicle's air reservoirs and shall provide an air supply for

air tools and etc.

AUXILIARY AIR INLET

There shall be an auxiliary air inlet installed to maintain truck air pressure, while truck is at rest. Location shall be per fire department specifications. A check valve and manual shut-off shall also be provided in this line.

The air inlet valve to have a check valve and manual shut-off in the inlet system.

DRIVELINE

Drivelines shall have a heavy-duty metal tube and be equipped with Spicer 1810 series universal joints. The shafts shall be dynamically balanced before installation. A splined slip joint is to be provided in each shaft.

FRONT AXLE

The front axle shall be a Reverse Elliot "I" beam type with inclined king pins, Rockwell-Standard Model FL-941 with a rated capacity of 20,000 pounds at the hub. The axle shall include 16-1/2" x 6" S cam brakes with automatic slack adjusters. Stroke indicators shall be incorporated to provide a visual indicator of brake wear.

REAR AXLE

The rear axle shall be a Rockwell-Standard Model RS24-160 with a capacity of 24,000 pounds at the hub. The single reduction differential shall have a ratio to allow an approximate top speed of 61 mph at 2100 rpm. The axle shall include 16-1/2" x 7" S-Cam brakes with automatic slack adjusters. Stroke indicators shall be incorporated to provide a visual indicator of brake wear.

All axles shall be purchased complete from, and certified by the axle manufacturer for the specific application. Brake chamber brand and size shall be determined by the axle manufacturer.

A five year Rockwell axle warranty shall be provided on the apparatus.

FRONT AXLE OIL SEALS

The front axle shall be equipped with oil type seals with viewing windows.

SUSPENSION

The front springs shall be semi-elliptical, 3.0" x 52", 11 leaf constant rate type. Heavy-duty telescoping shock absorbers shall also be provided.

Rear springs shall be semi-elliptical 3.0" x 52", 12 leaf constant rate type.

Springs shall match the GAWR of the vehicle.

FRONT TIRES

The front tires shall be Goodyear G-291 315/80R22.5 Load Range J (18 PR).

REAR TIRES

The rear tires shall be Goodyear G-159 12R22.5 Load Range H (16 PR).

WHEELS

The two (2) rear inner wheels shall be steel disc type, minimum 10 stud, with 11- 1/4" bolt circle.

Chrome plated nut covers shall be furnished.

WHEELS

The front and the rear outter wheels shall be polished aluminum disc type. Chrome plated nut covers shall be furnished.

ENGINE

The chassis shall be powered by a Detroit Diesel Engine as described below:

Model 6V-92TA JWAC-DDEC
Number of Cylinder Six
Bore and Stroke 4.84" x 5.00"
Displacement - Cubic Inches 552
Rated BHP 400 @ 2100 RPM
Torque 1350 ft. lbs. at 1200 RPM
Governed RPM 2100

Standard equipment on the engine to include the following:

- Aftercooler
- Cast rocker covers
- Fan - 30" diameter, 9 blade
- Dual fuel filters with check valve
- Governor - Electronic Distribution unit (EDU)
- Injectors - electronic, unit type
- Lube oil cooler
- Lube oil filter - full flow
- Starting motor - 12 volt
- Turbocharger

Cooling System

A serpentine core type radiator with removable upper and lower tanks shall be provided. The top tank shall have a deaeration device built in. A drain shall be located at the lowest point. The frontal area of the radiator shall be 1202 square inches. The total cooling system capacity shall be 14

gallons.

A five year or 50,000 mile engine warranty will be provided by Detroit Diesel.

EPQ CERTIFICATION

"EPQ" (End Product Questionnaire) certification shall be provided by the end manufacturer and shall be done on a completed unit (after pump installation and complete body installation). Any incomplete certifications (chassis only) shall not be acceptable.

SILICONE HOSES

All hoses in the cooling system shall be silicone type.

WATER FILTER

A Nal Cool #3000 water filter shall be provided in the cooling system and Nal Cool system conditioner shall be provided in the cooling system.

TRANSMISSION

An Allison HT-740, 4-speed automatic transmission with AC filter shall be provided. A lever control shift module shall be mounted to right of driver. Shift position indicator shall be indirect lighted for after dark operation. A transmission cooler shall be installed integral to the radiator. Gear ratios shall be as follows:

1st	-	3.69 to 1
2nd	-	2.02 to 1
3rd	-	1.38 to 1
4th	-	1.00 to 1
R	-	6.04 to 1

FUEL SYSTEM

The vehicle shall be furnished with a 50 gallon fuel tank. The tank shall be constructed of 12/14 gauge, hot rolled, pickled in oil steel, equipped with a swash partition and vent. The fuel tank shall meet all FHWA requirements including a fill capacity of 95% of tank volume, and all DOT and FMVSS regulations for rollover protection. A 2" diameter fill inlet shall be located on driver's side of the body and covered with a hinged, spring loaded polished stainless steel door marked "Diesel Fuel Only". Braided hoses shall be provided for the fuel lines. A 1/2" NPT drain plug shall be located in the bottom of the tank. The fuel tank pickup tubes and sending unit shall be accessible without having to remove the tank.

ALTERNATOR

A minimum 290 amp Niehoff A1-608 alternator with a heavy-duty, externally mounted integral regulator, shall be provided.

AIR COMPRESSOR

A Midland 16.1 CFM air compressor shall be furnished. The air compressor shall be gear or belt driven off the engine.

AIR CLEANER

A Farr Ecolite dry type air cleaner shall be furnished. Outside air shall be obtained through the top rear center of the cab complete with a stainless steel water separator. The air filter shall be mounted so as to provide easy access for serviceability.

AIR RESTRICTION INDICATOR

A Donaldson mechanical air restriction indicator shall also be furnished mounted in the cab.

EXHAUST

The exhaust shall be 5" diameter and shall discharge to the right side of the vehicle ahead of the rear wheels.

LUBRICATION PLATE

A permanent plate shall be installed in the drivers compartment which shall specify the quantity and type of the following fluids used in the vehicle: engine oil, engine coolant, chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid, and drive axle lubrication fluid.

EMERGENCY ENGINE SHUTDOWN

An electric emergency engine shutdown shall be provided which shall shut off the air supply to engine intake. A control shall be mounted in the cab near the driver with a guard to prevent accidental operation.

FAST IDLE SWITCH

A fast idle switch shall be provided which shall increase the engine speed to 1000 RPM.

CAB 6 PERSON

The cab shall be designed specifically for the fire service and as such is to provide extra strength and safety. The cab shall be of steel reinforced welded cage construction with galvanneal steel skin. The cab must be made in the factory of the bidder and must be the bidder's first line cab. Cab shall have an inside width of 89" and an outside width of 94", with a 4 point rubber isolated mounting system.

The front cab sheet shall have four (4) removable panels to provide easy access to all front mounted components and their attaching parts.

A large stainless steel grille with air tunnel shall be provided in the center front of the cab to provide air to the radiator. Air intake ducts shall be provided on each side of the cab, to the rear of the doors, to augment the capacity of air intake to the radiator.

Entrance steps to the driver's and officer's positions shall be built into the cab and constructed of aluminum diamond plate.

The cab doors shall be made of galvaneal steel construction. **(NO EXCEPTION TO THIS STATEMENT.)** Front cab doors shall be 71.75" in height x 34.75" wide. Rear doors shall be 71.75" in height x 30.69" wide. All cab doors shall have 6" nylon strap door checks and interior door locks. Doors are to meet Federal Motor Vehicle Std. #206. Flush mounted interior paddle type door handles shall be provided. The exterior door handles shall be of a large chrome plated lever type to allow personnel to open the doors with ease while wearing heavy gloves. Doors are to be hung on stainless steel full length hinges attached to cab and door by sixteen .25" bolts. The inside of each door shall be covered with removable vinyl door panels on the upper half, and metal kickplates on the lower portion.

Cab floors shall be of .125" aluminum treadplate so as to minimize maintenance. Cab floors shall have sloping toe boards. Aluminum .125" treadplate shall be provided on the cab roof.

A removable section in the canopy roof shall be provided to permit engine and radiator removal. Minimum opening to be 75.38" x 84.94".

ENGINE HOOD

The engine hood top and sides shall be fabricated of 16 gauge galvanneal steel, and the complete interior shall be lined with 1" acoustical foam noise barrier insulation. The complete exterior shall be covered with "Hushcloth" sound barrier floormat. This mat shall be 7/16" thick, and shall include a deep embossed wear surface, a one (1) pound per square foot sound barrier, and a closed cell Nitrile insulation layer. All insulation material must exceed MVSS 302 flammability requirements.

Hood side panels shall readily lift out completely to provide maximum access to the engine area. Engine hood shall be tapered from bottom to top approximately 1" to allow more elbow and shoulder room for the occupants of the rear jump seats.

Two (2) engine compartment worklights with individual switches shall be provided.

RADIO COMPARTMENT

A weatherproof compartment suitable for mounting Fire

Department radios shall be provided beneath the officer's seat. Access to this compartment shall be gained through a front drop down door. The compartment shall 13.38" high x 21.00" long x 12.50-19.62" wide.

FRONT FENDERS

Polished stainless steel front fenderettes with round removable aluminum innerliners shall be provided.

MUD FLAPS

Heavy duty rubber mud flaps with manufacturer's "logo" permanently embossed shall be installed one at each wheel.

CAB DOOR PANELS

The lower inner portion of each door shall be covered with aluminum diamond plate to serve as a door kickplate and prevent damage to the vinyl panels.

FRONT SEATING

The driver's seat and officer's seat shall be separate. Upholstery on each cushion and seat back shall be black 40 ounce vinyl, waterproofed and fire resistant, over polyurethane foam cushions. Driver's seat shall be bucket type, adjustable 4" minimum horizontally and 3" vertically.

DRIVERS SEAT

A Bostrom 910 air suspension driver's seat shall be provided.

Wise Bucket Seat for Officer(J or L)

OFFICER'S SEAT

The officer's seat to be a Bostrom bucket seat non air ride.

CREW CAB SEATING

Two (2) "Pack Back" jump seats with provision for SCBA brackets are to be provided in the rear section of the cab, one each side of engine, facing to the rear. Seat cushions to be a minimum of 18" wide x 15" deep from the front of the cushion to the face of the seat back. An area of 26.5" wide to allow maximum room for firefighters in full turnout clothing shall be provided.

JUMP SEATS

Two foldup forward facing jump seats shall be furnished on the rear wall of the cab, one each side of the engine hood.

SEAT BELTS

Retractable seat belts shall be furnished for all seats which shall meet Federal Motor Vehicle Standards. The driver

and officer's seats shall include shoulder harnesses.

SHOULDER HARNESS

Forward facing seating positions shall include DOT approved shoulder harnesses.

UPHOLSTERY

The interior vinyl upholstery and trim shall be black in color.

CAPACITY SIGN

A sign visible to the driver shall be provided which shall state the number of personnel the vehicle is designed to carry.

WINDSHIELD

The windshield shall be of tinted automotive laminated safety plate with a curved two-piece design. It shall have a height 27.06" and curved width 100.62" with 2,720 square inches of visual area. Two-speed, electric wet arm operated windshield wipers with intermittent control shall be mounted below windshield for accessibility and optimum windshield wiping in visual areas.

DOOR GLASS

Retractable, tinted, automotive type tempered safety door glass shall be provided in all four (4) doors. It shall be mounted in a reinforced stainless steel channel. The front glass shall be 20.12" high x 18.00" wide. A 1/4 vent window capable of being opened from the inside shall be furnished in each front door. The rear door glass shall be 20.12" high x 26.19" wide.

CREW CAB WINDOWS

Each crew cab side shall have one (1) tinted automotive type, tempered safety window mounted in rubber with a minimum size of 20.62" x 30.62" to allow maximum vision.

CANOPY SIDE WINDOWS

The canopy side windows between the front and rear cab doors shall also be sliding type.

REAR CAB WINDOWS

Two (2) 9.69" x 13.69" windows shall be provided at the rear of the cab, one each side.

HEATER AND DEFROSTER

A 57,000 BTU front heater and defroster shall be installed with a 3 speed, 425 CFM blower. Six (6) 4" multidirectional

defroster outlets shall be provided on the heater for directing warm air to the windshields.

AIR CONDITIONING UNIT

The cab and crew cab shall be equipped with dual compressor system, each rated at 33,000 BTU's with a combined total capacity of 66,000 BTU/HR. Each evaporator air flow shall be rated at 650 CFM's. Each evaporator shall have seperate controls for adjusting the thermostat and the fan speed. The evaporator system shall have four air diffussers per evaporator to allow for multi-directional air flow. Each difusser shall be adjustable up and down and side to side for individual preference. The dual evaporator system shall be compliant with all EPA regulations and use R-134A Refrigeriant. All hose used in the air conditioning system must be barrier type construction for containment of R-134A Refrigriant. The condensors shall be a low profile single fan compact design with dryer and pressure switch included. The condensors shall be installed on the cab roof.

DEFROSTER FAN

An adjustable 8" defroster fan shall be provided near the center portion of windshield with a two (2) speed control on the pedestal.

TILT STEERING WHEEL TELESCOPING

The upper steering column is to be of the tilt and telescopic type. A self-cancelling directional switch is to be mounted on the steering column with an ICC four way flash switch.

HANDRAILS

Four (4) extruded aluminum handrails with slip resistant inserts, two (2) each side to the rear of the cab doors, 1.25" diameter x 18" long shall be provided. A chrome plated grab handle shall be provided on the inside of each cab door and an 8" rubber covered grab rail shall be provided on the right hand side of the cab dash to assist in entry to the cab.

GRAB HANDLE

Eight (8) additional 8" rubber covered grab handle shall be provided and installed per fire departrment specifications.

MIRRORS

Two (2) 6.5" x 10" with seperate 6.5" x 6" convex lower section West Coast style mirrors shall be installed, one each side of the cab. The mirrors shall be retractable, spring loaded type, stainless steel two-point mounting.

CAB TRIM

Decorative molding is to be provided across the front and along both sides of the cab just below the windshield level.

SUN VISORS

Two (2) black 6.625" x 30.75" padded sun visors shall be provided, one on the driver's side and one on the officer's side.

HEADLINER

The cab shall be furnished with a removable headliner for serviceability of upper wiring. The headliner shall be of sound absorbing urethane foam backed with a layer of perforated vinyl and a polyurethane water/vapor barrier on both sides.

SCUFFPLATES

Stainless steel scuffplates shall be provided around all cab door handles.

ANGLE BRACKET FOR SCGA BRACKET

A 45 degree angle bracket shall be installed between the driver and officer to provide mounting for an SCBA bracket.

An additional SCBA bracket will be mounted in the rear canopy section of the canopy cab for storage of two (2) SCBA's. Bracket to be mounted between cab roof and engine hood.

CAB DASH AND INSTRUMENTS

For the safety of passengers, the cab dash shall be forward slanted,and fully covered with padded vinyl to match the cab interior.

A dash compartment with hinged door shall be provided to the right of center dash, and shall be a minimum 15" wide x 6" high x 6" deep.

A center, hinged, non-glare switch panel shall be provided to the right of the instrument panel and shall have rocker type switches with a light to indicate the switch is energized.

Three (3) hooded lights shall be provided to illuminate the switch panel with a rheostat for varying the light intensity.

Turn signal indicator lights shall be located to the right and left of the instrument panel with the high beam indicator light in direct center top of instrument panel.

Independent left and right hand wiper switches shall be installed in the cab dash convenient to the driver and properly illuminated.

Windshield washers are to be provided with accessible controls and a two (2) quart reservoir.

An air restriction indicator shall be provided.

A visual and audible alarm system shall be provided which will include sensors for high engine temperature and low oil pressure. A red, 5/8" square flashing indicator light shall be provided which shall indicate a cab or compartment door is open.

One green indicator light shall be installed in the driving compartment which shall indicate when the pump shift has been completed and shall be labeled "Pump Engaged". A second green indicator light shall also be provided in the driving compartment and also on the pump operator's panel. These lights shall be energized when the pump shift has been completed, the chassis transmission is engaged in pump gear, and the parking brake is applied. The light in the driving compartment shall be labeled "Ok To Pump". The light on the pump panel shall be located above the throttle control and shall be labeled "Warning: Do Not Open Throttle Unless Light Is On."

The main instruments panel shall include the following warning lights and indicators:

Spring brake "On" indicator light
High beam indicator light
Engine status warning lights
Low air pressure warning light
Turn signal indicator lights

These lights shall be a minimum of 5/8" square with function embossed on the face of the lens.

The standard instruments shall be mounted in a removable hinged panel in front of the steering column directly visible to the driver, and shall include the following:

Electric Speedometer with odometer
Electric Tachometer
Hourmeter
Oil Pressure Gauge
Water Temperature Gauge
Fuel Level Gauge
Air Pressure Gauges (2)
Transmission Temperature Gauge

A rocker type ignition switch with green indicator light, and a headlight switch with red indicator shall be provided to the left of the steering column.

VDO GAUGES

All gauges shall be VDO electric type.

VOLTMETER

A voltmeter shall also be provided on the cab dash. The voltmeter shall be made by VDO.

AMMETER

An ammeter shall be provided on the cab dash in addition to the voltmeter.

TRANSMISSION OVERHEATING WARNING LIGHT AND BUZZER

A red light and buzzer shall be installed on the cab dash to indicate when the transmission is overheating.

SPECIAL SWITCH PANEL

The switch panel shall be custom designed to provide exact labels for the lights specified.

CIGARETTE LIGHTER

A cigarette lighter shall be provided on the cab dash in a location accessible to the officer.

BATTERIES

Two (2) 12V 1400 CCA 8-D batteries shall be mounted one each side of the cab in the rear entrance way.

BATTERY BOX

Battery compartments shall be provided, one each side of the cab in the rear entrance way. Compartments shall be well ventilated, with lift up covers constructed of aluminum diamondplate for easy servicing. Heavy-duty battery cables shall be provided to maximize power available to the electrical system.

BATTERY MATS

The batteries shall be installed on a non-corrosive mat.

BATTERY DISCONNECT

A Guest 2303A battery on and off switch shall be supplied and mounted in the cab in a convenient location for the driver.

STARTER BUTTON

An engine starter button shall be mounted on the dash to the left of the steering column.

BATTERY CHARGER

There shall be one (1) Kussmaul Auto Charge 11DV dual system battery charger installed in the charge system. The charger shall be fully automatic, and shall maintain the truck batteries at a full charge level when connected to a 110 VAC source. Remote voltage sensing shall be provided to

compensate the charger output for the voltage drop in the charging wires.

CHARGING PLUG

A Cole Hersee 12001 two (2) pole break away, 20 amp., battery charge receptacle with spring loaded cover, and matching 1283-325 plug, shall be provided at a location to be specified later.

ELECTRICAL WIRING

All wiring to be automatic circuit breaker protected. The wire is to be high temperature type, GXL color coded, and imprinted with circuit function every 4 inches. Wiring connectors to be crimped type for trouble free service. All solenoids, relays, terminal blocks, and circuit breakers are to be located in an easily accessible compartment at the center of the cab dash or behind removable panels in cab front.

LIGHTS

Exterior cab lighting to 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 are to be rectangular quad type with chrome plated trim rings. Five pedestal type clearance and identification lights are to be installed across the leading edge of the cab.

MARKER LIGHTS AND REFLECTORS

Marker lights and reflectors shall include (2) red marker lights, (4) red rectangular reflectors, (2) amber rectangular reflectors and (1) red three light cluster recessesd in the rear step flange.

LICENSE PLATE LIGHT

A Chrome license plate light shall be installed on the rear of the vehicle.

HEADLIGHTS

The headlights shall be provided with halogen bulbs.

REAR PICKUP LIGHTS

Two (2) Unity 6" chrome plated deck lights with one (1) halogen spot type bulb and one (1) halogen flood type bulb shall be installed at the rear of the apparatus. Each light shall be manually operated and switched on and off at the light as well as from the cab.

FRONT DIRECTIONAL LIGHTS

There shall be two (2) amber arrow directional lights, and two (2) red halogen warning lights in headlight bezels

mounted in easily removable panels on the cab front. The warning lights shall be wired to a solid state alternating flasher.

DIRECTIONALS

In addition to the front directionals, KD 856-3301 "bug eye", side mounted directionals shall be provided on each side of the cab, above the front fenders.

STOP, TURN AND BACK-UP LIGHTS

Stop, turn and back-up lights shall be 7" individual fixtures. Fixtures shall be mounted on each rear face of the body compartments. Stop light shall be red Weldon 1010 series or other approved equal. Back-up light shall be clear flood light type Weldon 1010 series or approved equal. Turn light will be Weldon 1000 series with amber directional arrow.

STEPLIGHTS

Automatic steplights shall be provided at each cab entrance. Additional step worklights shall be provided to illuminate all steps and walkways.

SCENELIGHT

Whelen 97FCAOXU halogen scenelight with 13 degree optics and chrome plated flange ring shall be installed as directed.

INTERIOR LIGHTS

A three (3) light module is to be provided in the forward cab section for adequate night illumination. The outer two (2) lights are to be mounted in ball socket joints so they can be aimed as desired. The center light shall have a white lens with 2 bulbs. Lights are to have individual switches.

AUTOMATIC DOOR SWITCH

Automatic door switches shall be provided for the cab dome lights.

There shall be seven (7) additional dome lights with individual switch mounted in the cab. Three (3) shall be mounted in the forward cab section and four (4) shall be mounted in the rear crew section. One (1) of the lights in the forward section and two (2) in the rear crew section shall have red lens for night vision.

COMPARTMENT LIGHTS

A 5" diameter moonstone light shall be provided in each compartment with an automatic door switch.

COMPARTMENT DR. TEL-TALE

A red, 4" open compartment door tel-tale light shall also be installed on the ceiling in the forward portion of the cab.

TEL-TALE DASH LIGHT

There will be a light on the dash to indicate a door is open.

LIGHT BAR

A Code 3 model MX 7509A 69" light bar shall be mounted on cab roof. Light bar to be all light.

BEACON

Two (2) Force 4, model 550 rotating warning lights shall be installed on the rear upper portion of the vehicle. The lights shall be provided with red lenses and clear rotating bulbs.

WHELEN 73FCAORU HALOGEN INTERSECTION LIGHTS

A pair of Whelen 73FCAORU halogen intersection lights shall be mounted one (1) each side on the forward cab corners midway between the bumper and the windshield. The lights shall be wired to a solid state alternating flasher, and shall have red lenses.

AUDIBLE WARNING DEVICES

One (1) automotive electric horn controlled by steering wheel horn button shall be provided.

AIR HORN W/FOOT CONTROLS

Two (2) Grover 1501 chrome air horns shall be furnished. A pressure protection valve shall be installed in-line to prevent loss of all air from the vehicle air system. Two (2) Linemaster treadle type foot switches shall be provided to actuate the air horns, one (1) each side of the cab on the sloping portion of the toeboard. Air Horns to be recessed on right side extended front bumper.

AIR SHUT OFF VALVE

An air shut off valve shall be provided in the feed line to the air horns.

BACKUP HORN

One (1) backup horn activated when transmission is placed in reverse.

MECHANICAL SIREN

A chrome plated Federal Q2B siren shall be mounted on the front bumper extension between the two (2) hose wells. Two foot switches shall be provided, installed one each side of

the cab. An electric brake control shall be installed on the dash. Note: Fire Department will provide siren.

Foot Siren Switch

REAR STEP CAB BUZZER

There shall be a buzzer mounted in cab that shall alert the driver. The button that controls the buzzer shall be weatherproof and mounted on the left rear beavertail.

BREAKER BOX

An eight (8) place breaker box shall be installed.

RECEPTICLE (3)

120 volt twist lock receptacle will be mounted as directed by the fire department.

FLOODLIGHTS

Two (2) 500 watt, 120 volt, Extenda-Lite quartz floodlights with four (4) foot aluminum telescopic poles shall be supplied and installed on the rear of cab as directed by the fire department.

OPERATORS STAND

A 54.5 inch operators stand shall be furnished with flex joints between the cab and pump compartment and between the pump compartment and the body to provide for proper flexing of the apparatus without putting undue stress on the vehicle (No exception to this requirement). One (1) 12" x 35" stainless steel pump inspection door each side shall be provided. An open tray, 60" wide x 32" long x 12" deep shall be provided above the pump with removable aluminum diamondette flooring to provide access to pump from above. Both sides of the operator stand shall be brushed stainless steel.

CONTROL PANEL

All pump controls and gauges shall be properly marked and located at left side of the apparatus. The pump panel controls and gauges shall be illuminated by lights located beneath a polished stainless steel shield. All gauges and controls shall be mounted on a stainless steel panel with color coded identification of controls and gauges. Pump panels on both sides are to be easily removable.

Gauge and control panel shall be two separate panels for ease of maintenance. All master gauge panel instruments shall be easily accessible from above through a hinged door.

Polished stainless steel trim collars shall be installed around all suction inlets and discharge outlets. All push-pull discharge controls are to have chrome plated "T" handles. Push-pull discharge controls are to pull straight

out of panel. Controls which pull out at an angle shall not be acceptable. Remote control push-pull discharge rods shall be equipped with universal joints to eliminate binding.

The following controls and gauges shall be located on the control panel for convenient operation:

- All discharge controls
- Vernier engine throttle, electronic
- Relief valve control
- Primer Control
- Tank fill
- Tank to pump control
- Master Pressure gauge
- Master Vacuum gauge
- Engine oil pressure gauge
- Engine water temperature gauge
- Pump Hourmeter
- Stop engine/check engine warning lights and audible alarm
- Auxiliary cooler control
- Tachometer
- Underwriters half engine speed outlet
- Master pump drain control
- Individual pressure gauges
- water level indicator

A 6" diameter light with switch shall be provided inside the pump enclosure ans accessible through a door on the pump panel.

MASTER GAUGES

The pump vacuum and pressure gauges shall be silicone filled and manufactured by Span Instruments. They shall be a minimum of 4 1/2" in diameter and shall have white faces with black lettering. Gauges are to have a pressure range of 30-0-600.

The master pressure gauge, master compound gauge, and tachometer shall be grouped in the center of the gauge panel for ease of operation and observation of the entire pump operation.

PRESSURE GAUGES

Individual line pressure gauges for the 1.50" and larger discharges shall be furnished. They shall be silicone filled and manufactured by Span Instruments, a minimum of 2.50" in diameter and shall have white faces with black lettering. Gauges are to have a pressure range of 30-0-600.

A 2" weatherproof fuel gauge shall be mounted on pump panel indicating the amount of fuel in tank.

There will be one (1) voltmeter 2" in diameter mounted on the pump panel. The meter will read from 8 volts to 16 volts. The meter will be mounted in a well lighted area for

night operation.

Pump overheat gauge shall be an MC brand, and will have two (2) red lights that will be visible in daylight and will be of the flashing type. One (1) test button that will test the lights and electronic circuits shall be supplied. The unit will have the capability of activating a audible warning device. This unit shall activate at 132 degrees.

The MC Pump Overheat Indicator shall be provided with a warning buzzer.

A stainless steel light shield shall be provided on the right hand pump panel in addition to the left side.

Pump panel controls and gauges will be illuminated by a minimum of three incandescent lights installed under a polished stainless steel shield. One pump panel light shall come on when the pump is shifted into gear from inside the cab. This will afford the operator some illumination when first approaching the control panel. The remaining lights are actuated from a switch located on the pump panel.

The individual pressure gauge panel shall be hinged to provide drop out service and inspection capabilities.

The hinged gauge panel only to have quaarter turn fasteners.

RUNNINGBOARDS

Runningboards shall be made of 1/8" aluminum diamondette and shall be carried by heavy duty supports. An air space shall be provided between the aluminum runningboard, the body, and the operator stand to prevent moisture from being trapped.

The runningboards and rear step shall be double flanged, down and in, to eliminate sharp edges and provide additional strength.

CROSSLAY HOSEBED

There shall be (2) two crosslay hosebeds provided. Each hosebed shall have the capacity to carry a minimum of 200 feet of 1-3/4" double jacketed hose. Two inch (2") ball valves and plumbing shall terminate in the bottom of each lay with 1-1/2" NST 90 degree swivels. The controls and pressure gauges for the crosslays shall be installed on the pump operator's panel. Smooth stainless steel hose guides shall be provided on each side of the crosslay hosebed and a horizontal stainless steel hose guide with large radius shall be provided on each bottom outer edge. One adjustable partition shall be provided. The crosslay flooring shall consist of removable aluminum slats.

PUMP

Pump shall be a Waterous single stage 1500 gpm midship mounted centrifugal type, carefully designed in accordance with good modern practice. Pump shall be the class "A" type

and 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 when dry shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds through 20 feet of suction hose of the appropriate size.

Pump casing shall be close grained gray iron, bronze fitted, and horizontally split in two sections for easy removal of entire impeller assembly including wear rings without disturbing setting of pump in chassis or pump piping.

The impeller shall be of flame plated bronze and shall be accurately balanced for vibration free running. Impeller shaft to be stainless steel, accurately ground to size and polished under seals. Shaft to be supported at each end by ball type oil or grease lubricated bearings. Sleeve bearings or bushings shall not be acceptable.

The pump for ease and rapid servicing in the future must have the Waterous separable impeller shaft which allows true separation of the transmission from the pump without disassembly or disturbing either component. This must be accomplished by making a two-piece shaft separable between the flinger ring and packing gland.

This feature allows field service to be accomplished in much less time than before since each component (pump or transmission) can be repaired independently. Disassembly of the pump when the transmission requires service or vice versa is not required. No exceptions shall be accepted.

Mechanical pump seals shall be provided to eliminate the need for conventional packing rings.

Any component of the fire pump that requires grease lubrication, shall have the lubrication fitting remotely located just inside the right side pump access door.

PUMP TRANSMISSION

Housing shall be high tensile gray iron, three piece, horizontally split. Power transfer to pump to be through a Morse HY-VO drive chain. Chain to be pressure lubricated through oil pump. Chain sprockets to be cut from carburized, hardened alloy steel. Spur gears shall not be acceptable. Drive shafts are to be a minimum of 2.350 diameter hardened and ground alloy steel. All shafts shall be ball bearing supported. Case to be designed to eliminate the need of water cooling. Pump shift to be of air control type located to the right of the driver. A manual override shall be provided.

PRESSURE GOVERNOR

The pump pressure shall be controlled by a Detroit Diesel electronic pressure governor. The governor shall continuously monitor the pump pressure and send a signal to the Electronic Control Module (ECM) mounted on the engine. The ECM shall modulate the fueling in order to maintain a set pressure or RPM through almost all operating conditions.

In the **RPM mode** the governor system may be activated after the vehicle parking brake has been set and the transmission range selector is placed in neutral. When in this mode, the governor will maintain the set engine speed, regardless of engine load(within engine operating capabilities).

In the **pressure mode** the governor system may only be operated after the fire pump has been engaged, and the vehicle parking brake is set. When in the pressure mode, the governor shall monitor pump pressures and vary engine speed to maintain a precise pump pressure.

A pump cavitation protection feature shall also be provided which will return the engine speed to idle should the pump cavitate. Cavitation shall be sensed by the combination of the pump pressure being below 30 PSI and the engine speed above 2000 RPM for 5 seconds.

Delete Transfer Valve (Single Stage Only)

PRIMING DEVICE

Primimg pump shall be a Waterous electrically driven, positive displacement, rotary type with single quick action control on pump panel. The "T" handle control when pulled is to automatically open the priming valve and activate the primer motor at the same time, thus being a none hand operation. Primer valve is to be connected to the top of both pump volutes making it possible to prime the pump no matter if the pump is in pressure or volume. Primer shall be automatically lubricated from large (5 quart minimum) oil reservoir. Priming pump shall be built by the manufacturer of the fire pump.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system shall be installed to permit use of water from the discharge side of the fire pump for cooling of water circulating through the engine cooling system. Heat exchanger to be of brass construction and shall be a separate unit installed in engine compartment with valve control on operator's panel.

A 1/2" pump to tank recirculating line shall be provided with control on pump panel.

PUMP PIPING

All suction and discharge lines of 2" or larger shall use heavy-duty threaded pipe or heavy duty pressure/vacuum hose with stainless steel or brass end fittings. Sweat soldered

copper tubing is not acceptable. Where vibration or chassis flexing may damage or loosen piping, the pipe shall be equipped with victaulic or rubber couplings. Two and one half inch (2 1/2") and larger lines to drain through individual drain valves. All individual drain lines are to be extended to drain below chassis frame.

All water carrying gauge lines are to be of flexible polypropylene tubing to prevent breakage from vibration. All suction inlets and discharge outlets shall be equipped with National Standard Threads (NST).

DRAINS

A .75" push/pull drain or bleed off valve shall be provided for each 2.50" or larger hydrant inlet or discharge. The drains shall be recessed behind the panel with the control extending through the panel and located along the bottom of the side pump panels. The drain controls shall be properly labeled. The water discharged from the drains shall be routed so they drain below the chassis frame rails.

Push/pull drains shall also be included for all discharges smaller than 2 1/2".

PUMP INLETS

A 6" pump manifold inlet shall be provided on each side of the vehicle with long handle chrome plated cap. Removable die cast zinc strainers shall be provided in each side inlet to provide cathodic protection for the pump, thus reducing corrosion in the pump.

2 1/2" HYDRANT INLETS

One 2 1/2" hydrant inlet(s) shall be furnished on the left side of the operator's stand. The valve(s) shall be mounted vertically behind the panel and shall be provided with a push pull control(s). The valve(s) shall be of the drop out type. Two and one half (2 1/2) inch heavy duty galvanized piping shall be provided.

2 1/2 HYDRANT INLET

One 2 1/2" hydrant inlet(s) shall be furnished on the right side of the operator's stand. The valve(s) shall be mounted vertically behind the panel and shall be provided with a push pull control(s). The valve(s) shall be of the drop out type. Two and one half (2 1/2) inch heavy duty galvanized piping shall be provided.

INTAKE PRESSURE RELIEF VALVE

A 2-1/2" intake relief valve shall be installed on the pump with a minimum pressure adjustment of 75 to 250 psig. The surplus water shall be plumbed to the underside of the truck away from the operator and shall terminate with a 2-1/2" male NST fitting. A permanent label shall be provided near the outlet that states "Intake Pressure Relief Outlet - Do

Not Cap".

FRONT SUCTION

There shall be a 5" front suction that will mount through the front of the cab. The suction shall use 5" galvanized steel pipe and shall extend to the right suction side of pump.

The suction shall include a 5" Keystone butterfly valve with air actuated control and manual override.

The suction shall be provided with a 5" NPT x 6" NST adapter, screen, and chrome plated, long handled cap.

TANK TO PUMP LINE

A 3" tank to pump valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type, drop out design and constructed of bronze. The control handle shall be chrome push/pull locking "T" type and will be installed on the left side pump panel. A Waterous check valve shall be installed between the pump and the valve to prevent water from flowing back into the tank.

TANK FILL

There shall be a 1-1/2" pump to tank fill line installed with a 1-1/2" inline bronze valve. Valve shall be controlled at the pump panel with a chrome locking handle.

DISCHARGES

The pump shall be equipped with ball valve gated discharges listed below, to flow the rated pump capacity as specified in NFPA 1901. Side discharge valves shall be full flow 1/4 turn swing out type. All 2-1/2" outlets are to be controlled from the pump panel and shall be lockable in any position. All discharges shall terminate with NST threads.

All inlets and outlets shall include chrome plated NST caps or plugs.

4" and smaller, rocker lug with chains
4-1/2" and larger, long handle without chains

All 2" or larger discharges to which hose is to be connected that are not in the hosebeds, shall be provided with sweep elbows minimum 30 degrees.

LEFT SIDE DISCHARGES

Two (2) 2 1/2" discharges with pump mounted, bronze-fitted quarter turn ball valves with galvanized piping shall be located on the left side panel. The valve ball shall be of chrome plated bronze for wear resistance. The valves shall be capable of being locked or unlocked at the valve from the control panel at any position between open or closed, and shall operate freely up to maximum pump discharge pressure.

A valve seal shall be provided between the pump and valve stem mechanism to minimize air leaks and facilitate draining. The threads on the valves shall be 2 1/2" National Standard. Chrome caps and chains shall also be supplied. The valves shall be mounted with the valve body behind the pump panel, connected to the discharge side of the pump.

RIGHT SIDE DISCHARGE

One (1) 2 1/2" discharges with pump mounted, bronze-fitted quarter turn ball valves with galvanized piping shall be located on the right side panel. The valve ball shall be of chrome plated bronze for wear resistance. The valve shall be capable of being locked or unlocked at the valve from the control panel at any position between open or closed, and shall operate freely up to maximum pump discharge pressure. A valve seal shall be provided between the pump and valve stem mechanism to minimize air leaks and facilitate draining. The threads on the valve shall be 2 1/2" National Standard. Chrome cap and chain shall also be supplied. The valve shall be mounted with the valve body behind the pump panel, connected to the discharge side of the pump.

4" RIGHT HAND SIDE DISCHARGE

There shall be one (1) 4" N.S.T. discharge on the right pump panel. The discharge shall be piped to the discharge side of the pump through a 3-1/2" valve with 3-1/2" galvanized piping. The valve shall be pump panel controlled. The valve shall be equipped with a slow close feature.

Akron 1488 remote 'T' handle push pull controls, lockable in any position, shall be provided on all inline valves unless otherwise specified.

2 1/2" PRECONNECT

A 2-1/2" discharge shall be provided using 2-1/2" galvanized steel piping terminating at the right front of the hose bed. A 2-1/2" chrome male nst adapter shall be supplied on the end of the pipe. The discharge shall be controlled by a bronze inline 2-1/2" valve with the control mounted on the pump panel.

FRONT DISCHARGE

There shall be a 1-1/2" discharge with 2" galvanized and high pressure hose piping, that terminates at the right front portion of the bumper. The discharge shall be controlled by a 2" bronze quarter turn, ball type in line valve with control located on the pump panel.

The left and right side 2.5" discharges will be provided with chrome plated 30 degree elbows with reducers (2.5" female X 1.5" male) and chrome 1.5" cap and chain. The 4.0" discharge will be provided with a 4" NST female swivel X 4" Storz 30 degree adapter with blind cap and chain.

DELUGE RISER

A 3" deluge riser with galvanized piping shall be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping is to 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 valve shall incorporate a slow close feature.

A 3" ASA flange shall be provided on the deluge riser.

A Task Force Tips XG-18 Extend-A-Gun to be installed in the deck gun piping.

WATER TANK

A 750 U.S. gallon capacity, "T" type tank shall be located under the hose bed. The tank exterior shall be constructed of 1/2" stress relieved PT2 polypropylene sheet, burgundy in color, and UV stabilized for maximum protection. All joints shall be nitrogen welded and tested for maximum strength and integrity.

Baffles shall be constructed of 3/8" stress-relieved PT2 polypropylene, natural in color, which shall divide the tank into separate compartments. All baffles shall have vent openings at top and bottom to allow air and water movement between compartments. All edges of the baffles that are in contact with the interior of the tank, shall be nitrogen welded to the tank. The longitudinal baffle shall extend from the floor of the through the cover to allow for positive welding and maximum integrity. All baffles shall interlock with one another and shall be welded to each other as well as to the walls of the tank. The top of the tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal.

The cover shall be a 1/2" thick PT2 polypropylene, burgundy in color, and UV stabilized, and shall be of a multi three piece design. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and become welded to the transverse partitions.

A 12" long x 12" wide fill tower shall be located at the left front corner of the tank with an easy open, hinged, pressure relief cover. The tank fill opening shall be equipped with a 1/4" thick removable polypropylene strainer. A 4" I.D. overflow and vent pipe shall be incorporated. The overflow shall be covered to prevent loss of water when filling the tank.

The tank shall be supported by a cradle enclosing the entire bottom perimeter of the tank. The cradle is to be made of 3" x 3" x .25 steel angle, reinforced with .25 x 3" support strips, spaced not more than 24" apart. No area of the tank

bottom greater than 4 sq. ft. shall be unsupported. The cradle assembly is to be bolted to the chassis frame rails. All surfaces of the cradle that come into contact with the tank are to be lined with 1/8" x 2-1/2" nylon reinforced neoprene to prevent chaffing of the tank against the steel frame. No solid holdowns of the tank shall be used. This allows the tank to float free from the severe twisting of the apparatus frame and body.

A lifetime warranty shall be provided on the tank.

There shall be a 3" diameter threaded plug located in the bottom of the booster tank sump to give access for cleaning purposes.

TANK LEVEL GAUGE

An MC 4 light tank level gauge will be supplied and mounted in well lighted area on pump panel. The gauge shall include 4 red lights for 1/4, 1/2, 3/4, and Full.

HOSE BODY

The hose body shall be thoroughly reinforced at the corners and of attractive design. The bottom of all hose compartments shall be provided with aluminum slating, to provide ventilation. The interior of the body must be smooth and free from all sharp projections, which might damage hose.

HOSEBED PARTITIONS

Three (3) galvanneal hosebed dividers shall be furnished to separate individual hose loads. The dividers are to be fully adjustable by sliding in tracks located at the front and rear of hosebed. The dividers shall be held in place by tightening two bolts at the forward and rear ends of the partition. Mounting bolts shall turn into threaded slide blocks with only the head of the bolt in the hosebed to eliminate damage to the hose.

BODY CONSTRUCTION

The body and compartments shall be constructed of heavy gauge galvanneal steel. The front portion of the right and left hand side compartments shall mount to a front cross panel, which shall be constructed of 1-1/4" structural steel tubing and 12 gauge steel. This cross panel shall bolt to the chassis frame. The rear portion of each side compartment assembly shall bolt directly to the rear step support which shall be constructed of 3" channel. The compartment floors shall be a minimum of 12 gauge steel. Compartment flooring shall be of the sweep out design with the floor higher than the compartment door lip. Compartment door openings are to be framed by flanging the edges and bending out again .75" to form an angle. A 1/8" bright aluminum diamondette covering shall be installed over the side compartments extended with a 45 degree bend to provide drip protection. The aluminum diamond plate shall not form the compartment

top, but shall be an overlay. The front and rear edges of the covers shall be rolled over 1 ", and the front face of the side compartments shall be covered with bright aluminum diamondplate. All body components covered with aluminum diamond plate shall be coated with "Tectyl" prior to installation. All seams of compartments shall be caulked with 3M 606-NF or equal acrylic sealant.

Round removable aluminum fender innerliners shall be provided to provide for ease of maintenance and to prevent rust pockets. For increased safety, there shall be no sharp objects protruding into the wheelwell area.

The rear facing and the inside face of beavertails shall be constructed of or covered with adequately reinforced aluminum diamondette. All aluminum treadplate shall be secured with threaded fasteners. All exposed threads shall be capped.

The compartment sizes shall be as follows:

One (1) compartment ahead of rear wheels, left side, 40.50" wide x 64.50" high x 23.75" deep lower half(10.75" upper). Door opening 36.50" wide x 61.50" high.

One (1) compartment behind rear wheels, left side, 33.50" wide x 64.50" high x 23.75" deep lower half(10.75 upper). Door opening 29.50" wide x 61.50" high.

One (1) compartment above wheel well, on the left side of the vehicle, 60.00" wide x 33.25" high x 10.75" deep. One door opening 53.38" wide x 30.38" high with horizontally hinged lift up doors shall be provided.

All vertical hinged doors shall be provided with stainless steel double spring door stays.

All horizontal hinged doors shall be provided with pneumatic piston operated door holders. The door holders shall support the weight of the door in the open position.

One (1) compartment ahead of rear wheels, right side, 40.50" wide x 28.25" high x 23.75" deep. Door opening 36.50" wide x 27.50" high.

One (1) compartment behind rear wheels, right side, 33.50" wide x 28.25" high x 23.75" deep. Door opening 29.50" wide x 27.50" high.

Two (2) compartments above wheel well, on the right side of the vehicle, 61.00" wide x 33.38" high x 10.75" deep. Two door openings 55.00" wide x 30.38" high with horizontally hinged lift up doors shall be provided.

All vertical hinged doors shall be provided with stainless steel double spring door stays.

All horizontal hinged doors shall be provided with pneumatic piston operated door holders. The door holders shall

support the weight of the door in the open position.

REAR COMPARTMENT

One (1) compartment at tailboard 46.00" wide x 46.00" high x 24.00" deep. The door opening shall be approximately 43.00" wide x 38.50" high. Two (2) vertically hinged door shall be provided.

Six (6) chrome platedfolding steps shall be provided at the rear of the apparatus to access the hosebed, three (3) each side of the vehicle.

Credit For Doulbe Doors IPO Rollup Door

The hose body side panels and partitions shall be raised as necessary to provide for the required hose load.

COMPARTMENT DOORS

The compartment doors, unless otherwise specified, are to be lap type, double panel construction, with 14 gauge outer and 16 gauge inner panels. The material used in the body side doors shall match that used in the body construction **(NO EXCEPTION TO THIS STATEMENT)**. The interior of the doors shall be fully rust proofed after assembly with a rust preventative compound (AUTOARMOR or equal) that is capable of wicking into seams and displacing moisture. The doors shall be weatherstripped with an automotive type extruded rubber inner seal and a second outer seal of closed cell rubber on the outer lap edge of the door to prevent damage to the paint finish. The doors shall be mounted on stainless steel piano hinges with a pin diameter of .25". Mounting holes shall be slotted vertically on one side of the hinge and horizontally on the other side to provide for proper adjustment of the door. The hinge pins shall have spun ends to hold them in place and provide a finished look. Eberhard 206 latches with stainless steel "D" ring handles shall be provided. Isolation tape shall be furnished between the door hinge and door jamb. A rubber gasket shall be provided between the "D" ring handle and the door.

INTERIOR COMPARTMENT LOUVERS

All compartments shall be furnished with two (2) sets of four (4) louvers, 3 1/2" long. The louvers shall be stamped directly into the back wall of the compartment. In no case may louvering be located in the door unless specifically directed by the purchaser.

BODY HANDRAILS

Handrails to be 1 1/4" polished extruded aluminum with rubber inserts. Two (2) rails approximately 30" long, one (1) on each beavertail, and one (1) crossrail above rear of hosebed, between rear stanchions shall be furnished. The rear crossrail shall be reinforced with a 1/2" threaded steel rod running the full length of the rail.

A horizontal handrail shall be provided on the rear tank facing just above the intermediate rear step.

Black Dri-Deck flooring shall be provided in each compartment.

A mike and speaker compartment with brushed finish stainless steel door with chrome plated latch shall be furnished adjacent to the pump operator's panel. The compartment size shall be 9" wide x 12" high x 8" deep with a 6.5" x 12" door opening.

The mike compartment door shall be louvered for use with a speaker.

REAR FENDERS

Polished stainless steel fenderettes shall be provided on the rear of the body around the wheel openings. A rubber welting shall be installed in the seam between the body and the fenderette to provide a seal in order to keep moisture from entering.

WHEEL WELL AIR BOTTLE COMPARTMENTS

There shall be four (4) air bottle compartments located in the rear wheel wells. The compartments shall be fabricated from 14 gauge steel to match the body type, and shall provide a minimum of 26.00" usable depth. The compartment doors shall be of 14 gauge brushed stainless steel secured by a full length stainless steel hinge with a 1/4 turn hook "D" Ring handle. The compartment shall be a minimum of 8" x 8" and shall be provided with a wooden bottle rack with a polyurethane clearcoat finish. Rubber strips shall be installed on the cleats of the bottle rack to prevent damage to the paint finish on the compartment floor, and to keep the rack in it's proper position.

Air bottle compartment to have a 1" downward slope and lined with rubber padding.

REAR STEP

The rear step shall be 20" deep and shall have deep flanges. The step shall be constructed of 1/8" aluminum diamondplate. The step shall be installed over a heavy duty steel frame-work to prevent the step from bending and flexing. This step support shall be bolted directly to the chassis frame rails.

The step shall be held away from the body 1/2" to prevent moisture from being trapped between the step and the body. No Exception.

Two (2) large chrome plated folding steps with a minimum of 42 square inches of serrated non-skid surface per step shall be provided. The steps shall be tested to withstand a minimum of 2000 pounds static load. Heavy duty stainless steel springs shall be incorporated in the hinge to hold the step in either the open or closed positions. The steps shall

be located on the left side front face of sode compartments next to pump panel. No steps can be provided on the right side due to the ladder rack.

ADJUSTABLE SHELVES

There shall be seven (7)) adjustable shelf made from 12 gauge galvanneal steel. Each shelf shall be supported by four (4) stainless steel angles bolted to alumastrut tracks for adjustability. Shelves to be located per fire department specifications.

Stainless steel scuff strips approximately .50 wide shall be provided on the inside lower edge of of each upper compartment door opening to protect the painted finish.

GROUND LADDERS

The following ladders shall be fire department furnished.

one (1) 35 ft three section, series 1225-A
one (1) 14 ft roof ladder, series 775-A
one (1) 13 ft combination jack-knife "A" and single ladder, series 300-A
one (1) 10 ft folding, series 585-A

Mounting brackets shall be provided for customer mounted folding ladder.

The ladders are to be installed on the right side of the hose body on painted steel ladder brackets. The ladder brackets shall have up and down adjustment without the need to drill holes or modify the brackets.

Polished aluminum pull/twist type ladder clamps shall be provided for the ground ladders. Clamps shall be attached to the roof ladder rungs, and shall be designed so that when the outer ladder is removed, the clamps can be moved a half turn to hold the extension ladder in place.

HOSE TROUGHS

Two (2) hard suction hose sleeve is to be carried in "V" shaped trough, located on the left side of hose bed, and held in place by chrome plated spring type clamps.

PIKE POLES/MOUNTING

The following pike poles shall be furnished by the fire department.

one (1) 6 ft. pike pole w/wood handle.

one (1) 10 ft. pike pole w/wood handle.

The pike poles shall be mounted in tulip clips above the

ladders.

HYDRAULIC LADDER RACK

The ground ladders shall be mounted above the right side compartments on a swing down ladder rack. This rack is to be constructed of 6061 aluminum plate and 6063 aluminum tubing. The rack is to be mounted to the body at three pivot locations; front, rear, and center. All pivot locations shall be bronzed bushed and all pins shall be 1" diameter minimum. The center arm shall be constructed of two 3/4" thick aluminum plates spaced no less than 4.75" apart. The side pivot arms shall be constructed of solid 3/4" x 2-1/2" aluminum bar, gusseted at the top where joining the tube structure. The tube structure under the ladder shall be no less than 2" x 2" x 1/8" wall and shall be diagonally braced. The ladder must be secured with two leather lined quick release ladder locks.

One (1) double acting hydraulic cylinder shall be furnished at the center pivot location to move the rack up and down. The cylinder shall have a 2 1/2" diameter bore size and a 1-1/4" diameter piston rod size. The piston rod shall be threaded and provided with an adjustable clevis. Mounted directly to the cylinder shall be a flow control valve to prevent the rack from dropping suddenly in case of hydraulic line burst or leakage. A tie rod type cylinder with O-ring seals will not be acceptable.

A door shall be provided to cover the hydraulic cylinder and will close automatically when the rack is in the up position.

The hydraulic cylinder shall be operated by an independent hydraulic pump coupled to a 12 VDC motor. The pump shall be capable of 150 cubic inches of oil a minute at 1000 psi. The pump reservoir shall be made of high density polyethylene and hold 46 cubic inches of oil.

A guarded toggle switch shall control the hydraulic pump through a 12 volt relay. This switch shall be located on the pump panel to allow the operator full view of the rack when lowering. An over center stainless steel cam lock shall secure the ladder rack when in the up position. This cam lock shall prevent the ladder rack from moving both side to side and from moving fore and aft during road travel. The cam lock shall be installed at the forward position within easy reach of the operator. An indicator light shall be installed in the cab to notify the driver when the cam lock is unlocked from the stored position. There shall be interlocks to prevent the rack from being lowered when the cam is closed or when the compartment doors are open in the area of ladder rack travel.

The ladder rack shall be capable of being lowered within 12 seconds. When lowered, the bottom of the rack shall not be more than 54 inches above the ground.

ZICO COLLAPSIBLE ALUMINUM WHEEL CHOC

Two (2) Collapsible aluminum wheel chocs Model CAC-44 and Holder QCH-44-H shall be furnished and mounted by the manufacturer.

PAINT PREP AND FINISH

All bright metal parts shall be chrome plated or highly polished stainless steel. The body and cab shall be treated in critical areas during assembly with "TECTYL" rust prevention material. The complete exterior of the apparatus shall be finish painted with polyurethane paint of the highest quality. The compartment doors shall be fitted, then removed and painted separately to ensure finish paint behind the hinges and seals. The interior of the cab shall be finish painted before doors are mounted or any assembly is started to insure a finished painted surface beneath trim items.

PAINT PREPARATION

To ensure the longest possible life of any coating, a paint systems strength is based on the surface preparation. In order to ensure the longest possible life of any coating a thorough proceedure of surface prep must be adhered to. All subtracts, steel and stainless steel, are thoroughly cleaned, before painting, with an aggressive wax and grease remover, followed by a high-pressure washer. All surfaces are then abraded with a minimum of 80 grit sand paper and all welds are properly cleaned with an aggressive wax and grease remover. This detailed process is performed on all Seagrave vehicles to ensure the best possible base for a coating system.

Primer

All prepared surfaces are primed with a minimum of three coats of PPG High solids Epoxy Primer, DPHS 52. This process ensures that the substract will successfully hold all subsequent topcoats and provide excellent corrosion protection.

Topcoat

All Vehicles are topcoated with the highest quality polyurethane available on the market. Durethane, Concept, and Delta High Solids from PPG. These direct gloss colors will provide long lasting color and gloss retention. Serveral full wet coats are applied to the bodies and cabinets to ensure the most durable finish possible.

Painters

All Seagrave painters are PPG certified. These painters are re-certified annually in order to be the most up-to-date technicians in the industry.

Facility

The Seagrave finishing facility is PPG Certified. In order to be certified a facility must meet or exceed the extensive and stringent requirements demanded by PPG. All booths, compressors, guns and even safety equipment are approved and randomly audited by the PPG Fleet Group.

PAINT WARRANTY

A Paint Performance Guarantee will cover the areas of the vehicle finished with specified products for a period of Five (5) years beginning the day the vehicle will be delivered from the PPG Certified Original Equipment Manufacturer to the vehicle owner.

This guarantee includes but is not limited to:

-Peeling or delamination of the topcoat and/or other layers of paint.

-Cracking or Checking

-Loss of gloss caused by cracking, checking and hazing.

-Any paint failure caused by defective PPG Fleet Finishes which are covered by this guarantee.

The inside of the cab shall be painted textured flat black.

REFLECTIVE STRIPPING

A 4" reflective stripe shall be provided around the perimeter of the vehicle at a maximum height of 60" above ground level. At least 60 percent of the perimeter length of each side and width at rear, and 40 percent of the perimeter width at the front shall have the reflective stripe per NFPA standards.

A one inch border shall be provided above and below the large reflective stripe with a 1/2" gap on each side of the 4" stripe.

MISC ITEMS

One (1) bag of miscellenous screws, nut, and bolts will be provided.