THE CORPORATION OF THE CITY OF BROCKVILLE
BY-LAW NUMBER 122-96

A BY-LAW OF THE CITY OF BROCKVILLE RESPECTING THE PURCHASE OF A 65 FOOT TELESQUIRT FIRE TRUCK

WHEREAS pursuant to Section 311(1) of the Municipal Act R.S.O.1990, c.M45, as amended, councils of every municipality may pass by-laws, subject to subsection (2), for purchasing conditionally or otherwise, or for renting for a term of years or otherwise, machinery and appliances for the purposes of the corporation, and for borrowing money for the purpose of paying the purchase price for any period not exceeding five years and for issuing debentures for the money so borrowed, or for issuing to the vendor debentures payable within that period in payment of the purchase money; AND

WHEREAS Council deems it expedient to undertake the purchase of the said equipment in order to provide the fire department with the capability to fulfil their mandate of delivering adequate fire protection to residents and business in the city.

NOW THEREFORE THE COUNCIL OF THE CORPORATION OF THE CITY OF BROCKVILLE ENACTS AS FOLLOWS:

1. **DEFINITIONS:-** **(In this section)**

(a) **"municipality"** means a municipality as defined in the Municipal Affairs Act.

2. **THAT** purchase of a 65 foot Telesquirt Fire Truck be under taken as detailed in the specifications attached hereto as "Appendix A".

3. **THAT** the estimated budgeted cost of the purchase is Four Hundred and Ninety One Thousand, Eight Hundred and Thirty Four Dollars ($491,834.00)

4. **THAT** the Treasurer of the Corporation be and is hereby authorized to expend the sum of Four Hundred and Ninety One Thousand, Eight Hundred and Thirty Four Dollars ($491,834.00) for the purposes aforesaid.

5(a). **THAT** the Mayor and Treasurer of the Corporation are hereby authorized to obtain from any bank or banks or other sources, temporary advances at a borrowing rate not exceeding the banks prime lending rate to Municipalities, by way of a promissory note or notes or otherwise but not to exceed the sum of Four Hundred and Ninety One Thousand, Eight Hundred and Thirty Four Dollars ($491,834.00) being the total budgeted cost of the said purchase, until and pending completion of the said undertaking.

5(b). **THAT** a promissory note or notes or other vouchers sealed with the seal of the Corporation and signed on behalf of the Corporation by the Mayor and Treasurer be given to the bank or banks or other lenders for advances obtained on the authority of this instrument and providing for repayment of said advances with interest thereon.

5(c). **THAT** the Treasurer of the Corporation is hereby directed and authorized to apply in payment of said advances with interest thereon all monies borrowed on the credit of the Corporation to defray the cost of the said works and all monies from other sources properly applicable to the cost of the said undertaking.

5(d). **THAT** the Treasurer of the Corporation is hereby authorized to approve for payment any additional expenditures for the said capital project from contingency funds allocated for this purpose, subject to the following conditions and limitations:

1. **That** the request for the additional expenditure is submitted in writing by the Project Manager to the Treasurer of the Corporation; and
2. **That** the approval of the Chief Administrative Officer or designate has been obtained for the additional expenditure being requested; and
3. **That** the amount of the approved additional expenditure shall not exceed Ten Percent (10%) of the authorized budgeted cost of the said undertaking; and
4. **That** the amount of additional expenditure approved as aforesaid shall not exceed the greater of the balance remaining in the capital fiscal management reserve account or the amount that Ten Percent (10%) is of the approved budgeted cost of the said capital project providing that this amount is no greater than Twenty Five Percent (25%) of the funds available in the capital fiscal management reserve account.

6. **THAT** upon completion of the said works, short or long term borrowing by way of debenture(s), bank loan(s) or from other available sources be obtained to fund the unfinanced capital outlay, said funding not to exceed the term of ten (10) years, at a rate of interest to be hereafter decided upon by Council and for an amount not to exceed the sum of the unfinanced capital outlay. Repayment of the said borrowing(s) shall be chargeable upon all the ratepayers in the City of Brockville.

GIVEN UNDER THE SEAL OF THE CORPORATION OF THE CITY OF BROCKVILLE AND PASSED THIS 24TH DAY OF SEPTEMBER A.D.1996

MAYOR **CLERK**

APPENDIX "A"

PROPOSAL #: 852

FOR: BROCKVILLE FIRE DEPARTMENT
360 LAURIER BOULEVARD
BROCKVILLE, ONTARIO
K6V 6C5
PHONE: 613-498-1363

CONTACT: PETER MULVIHILL
PHONE:

ALTITUDE: 2000
PERFORMANCE BOND NOT REQUIRED
PRE-PAINT INSPECTION NOT REQUIRED
CHASSIS PRE-PAYMENT REQUIRED
JOB PER PRICING & PROPOSAL & SPECIFICATION
AERIAL PRE-PAYMENT REQUIRED
NO HEIGHT RESTRICTION
NO LENGTH RESTRICTION

DEALER #: 148

NAME: FORT GARY INDUSTRIES
460 MCPHILLIPS STREET
WINNEPEG, MANITOBA, CANADA

PHONE: (204) 586-8261

SALESMAN: A.J.STONE/FGI

NOTES: QUANTUM CHASSIS, NO BODY
65' TELESQURT BY PIERCE, BODY FGI

1 QUANTUM CHASSIS

The Pierce Quantum, the custom chassis developed exclusively for the fire service, offers the most innovative designs of any custom fire truck chassis manufactured today. The quality, the craftsmanship, cab comfort, and the attention to detail go hand and hand.

This custom chassis has seating for Six firefighters.

2 GVW RATING

The GVW rating will be 51,100 pounds.

WHEELBASE

The wheelbase of the Quantum chassis will be 202.5" (SAME AS E7874)".

3 FRAME

The chassis frame will be built with two steel channels bolted to four cross members. The side rails will have a 13.38" tall web over the front and mid sections of the chassis and a smooth taper to a 10.75" tall web over the rear axle. The frame rail RBM rating is 2,859,122 over the critical regions of the frame assembly and a RBM rating of 2,085,803 over the rear axle. The frame rails are constructed of 110,000 psi yield strength heat treated steel .375" thick and with 3.50" wide flanges with a section modulus of 25.992 inches cubed. In addition a full length main frame rail channel liner will be provided. The liner will be 100,000 psi heat treated steel measuring 12.675" x 3.00" x .25" with an RBM rating of 1,594,945 pounds. Total RBM at wheel base center is 4,454,067 pounds per rail and total section modulus is 40.492 inches cubed.

The frame rails will have a LIFE TIME WARRANTY for cracks and failure, excluding accident or abuse.

4 FRONT AXLE

The front axle is a Reverse Elliot "I" beam type with inclined king pins. It is a Rockwell Standard Model axle FL-943 with a rated capacity of 20,100 pounds. The turning angle will be 45 degrees.

To provide a smoother ride, the front axle will be furnished with heavy duty (Monroe Gas Magnum 65) telescoping gas shock absorbers.

Oil seals with a viewing window will be provided on the front axle.

5 REAR AXLE

The rear axle is a Rockwell RS30-180 with a capacity of 31,000 pounds. The single reduction differential will have a 4.89 to 1 ratio to allow an approximate top speed of 55 M.P.H. at governed engine speed.

The Rockwell 5 year axle warranty will be provided with the apparatus.

The rear axle will be furnished with oil seals.

6 SUSPENSION

The front springs will be a heavy duty taper leaf design, 54" long by 4.00" wide with a ground rating of 21,000 pounds. The taper leaf design will provide maximum life and optimum ride quality.

The rear springs are semi-elliptical, 3.00" x 52.00", 11 leaf main with a ground rating of 31,000 pounds. Castings will be used for spring hangers with provisions for lubrication. The grease fittings are 90 degree type and are accessible without removing the wheels or cutting any sheet metal. The two top leaves wrap the forward spring hanger pin and the top leaf wraps the rear spring hanger pin on both the front and rear suspensions.

ANTI-LOCK BRAKE SYSTEM (ABS)

This vehicle will be equipped with a Wabco anti-lock braking system. The ABS will provide antilock braking control on both the front and rear wheels. It is a digitally controlled system that utilizes microprocessor technology to control the antilock braking system. Each wheel will be monitored by the system. When any particular wheel begins to lockup, a signal is sent to the control unit. This control unit then reduces the braking of that wheel for a fraction of a second and then reapplies the brake. This antilock brake system eliminates the lockup of any wheel thus helping to prevent the apparatus from skidding out of control. Your apparatus will normally stop in shorter distances and provide the driver full control at all times.

7 BRAKES

The service brake system is full air type by Rockwell-Standard.

The front brakes will be ADB1560 DISC type with Haldex automatic slack adjusters, and 16.50" x 7.00" CAM operated at the rear with Haldex automatic slack adjusters

The system will meet or exceed the current FMVSS-121 requirements.

Other components featured in the Pierce brake system include:

- 16.1 CFM air compressor.
- Bendix Westinghouse dual brake treadle valve.
- Heated automatic moisture ejector.
- Total of air system capacity of 5198 cu. in.
- Two air pressure gauges with red warning light and audible alarm (on cab instrument panel).
- 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 providing automatic spring brake application at 40 psi.
- Bendix Westinghouse AD-9 air dryer.
- Color coded nylon brake lines wrapped in loom for the full length of the hose.
- An aluminum brake line junction block will be provided under cab. It is a separation point (and maintenance checkpoint) for those air lines routed to the cab.
- An all wheel lock-up system will be installed which will apply air to the front brakes and use the spring brake at the rear.

- An air inlet system, allowing station air to pressurize the brake system through a shoreline hose, will be provided. Inlet is equipped with a male coupling and is located on drivers seat riser. An in-line check valve is also installed. Station air discharges into the "wet" tank of the brake system. A mating female coupling will also be supplied (loose).

ENGINE
The chassis will be powered by a Detroit Diesel engine as described below:

- MODEL: Series 60, 12.7L, 430 HP
- NUMBER OF CYLINDERS: 6
- BORE AND STROKE: 5.12" x 6.30"
- DISPLACEMENT: 774 cu. inches
- RATED BHP: 430 at 2100 RPM
- TORQUE: 1450 at 1200 RPM
- COMPRESSION RATIO: 15 : 1
- GOVERNED RPM: 2100

Standard Equipment on the engine will include:

- Air cleaner: Farr
- Air compressor: Bendix 16.1 CFM
- Exhaust: single with discharge right side, ahead of rear wheels
- Dual fuel filters with check valve
- Governor: electronic control module
- Injectors: electronic unit type
- Lube oil cooler
- Lube oil filter: full flow
- Starting motor: 12 volt
- Turbocharger
- Air to Air Aftercooled

Engine will carry a five year warranty provided by Detroit Diesel.

COOLANT LINES
Gates or Goodyear rubber hose is used for all engine coolant lines installed by Pierce. Hose clamps are the "constant torque type" to prevent coolant leakage. They will expand and contract according to coolant system temperature thereby keeping a constant clamping pressure on the hose.

The exhaust outlet will be equipped with a chrome plated elbow.

RADIATOR
The radiator and complete cooling system fully meets the NFPA cooling system standards and the engine manufactures guidelines at maximum load conditions.

The radiator will be mounted in parallel with the charge air cooler to avoid drawing pre-heated air from the charge air cooler across the radiator fins, thus creating efficiencies in cooling performance. The fan will be mounted directly to the cooling package and within a molded shroud to minimize the required fan tip clearances and to optimize air flow efficiencies and cooling performance.

Cool air will be drawn through the radiator by a mechanically driven fan. The fan will be shaft driven off the engine crank.

The radiator will have sufficient capacity to exceed all cooling requirements specified by the engine manufacturer under all operating conditions. The system will have a low coolant sight bulb mounted on the surge tank and an electronically controlled low coolant indicator mounted on the cab instrument panel.

A remote surge and de-aeration tank will be provided to optimize the cooling system for all operating conditions. The cooling system will be equipped to maintain a pressure at 10 psi for maximum heat dissipation. The system will have drain cocks located at the lowest point of the cooling system. Circulation baffles will be furnished to prohibit hot air from the engine compartment from adversely affecting cooling system performance.

The radiator will be constructed with 175 tubes placed in 3 rows with 16 fins per inch and bonded together by a patented "beta-weld" process for increased strength, longer life and solder-bloom corrosion protection. The completed core will have a minimum 1200 square inches of cooling area. The entire cooling package assembly will be mounted in a manner to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain. The radiator core is compatible with commercial antifreeze solutions.

The engine and cooling system with hoses has a coolant capacity of approximately 60 quarts. The cooling system is protected

with an antifreeze solution to minus 30 degrees F. Nalcool radiator additive will be added to the coolant as a corrosion inhibitor and lubricant.

ENGINE TUNNEL
Engine tunnel is constructed of .125" aluminum and is tapered at top to allow for more driver and passenger elbow room.

Provisions for checking the engine and transmission oil is provided on the engine tunnel and is accessible without tilting the cab.

The engine is accessible with the cab tilted. The engine is also be removable with the cab tilted.

The engine tunnel inside the cab is 20" from cab floor to top of engine tunnel.

The width of the engine tunnel is 26" on the top tapered surface and 41" at floor area.

The engine tunnel is also taper and narrow towards the rear as it extends into the crew cab area. The width of the engine tunnel on the top tapered surface at the rear is 20", therefore providing optimum room for the fire fighters seated in the crew cab rear facing seats. The engine hood will 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.

FUEL TANK
A sixty-five gallon fuel tank is provided and mounted at the rear of the chassis. The tank is constructed of 12 gauge, hot rolled steel. It is equipped with swash partitions and a vent. Located in a low point of the fuel tank is a .75" drain plug. A fill inlet is located on the driver's side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Diesel Fuel Only". A 1/2" diameter vent is installed from tank top to just below fuel fill inlet.

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

Servicing the fuel tank pick up tubes and the fuel gauge

sending unit can be accomplished without having to drain the fuel or drop the tank.

AUXILIARY FUEL PUMP
An auxiliary electric fuel pump will be installed for repriming the engine, with the control located on cab instrument panel.

ENGINE HEATER
A 1500 watt, 120 volt, immersion type engine heater will be installed with the AC power inlet located RECEPTACLE TO BE LOOSE, FGI TO INSTALL ON PUMP PANEL.

ENGINE SHUTDOWN
An emergency engine shut-down by means of incorporating a flapper over the engine air intake will be provided with a pnuematic push-to-activate control inside the cab.

ENGINE GOVERNOR
An electronic engine governor will be provided. The governor is manufactured by Detroit Diesel and is built into the engine ECU. The governor will be programmed to control engine speed so the generator's output frequency is a nominal +/- 2 hertz of its rating. The engine governor will automatically increase engine speed only after all interlocks are properly engaged.

An electrical instrument/gauge panel will be provided at the load center location for the operator to monitor generator electrical output. An indicator light will be provided at the generator's instrument/gauge panel to indicate high engine temperature and/or low oil pressure.

A "HIGH IDLE" control switch will be provided inside the cab on the instrument panel. This switch will activate the engine governor and provide a high idle engine speed when the generator is not engaged. The high idle system will increase engine speed only after all safety interlocks have been set.

DRIVELINE
The driveline will have a heavy duty metal tube and will be equipped with Spicer 1800 series universal joints. The shafts are dynamically balanced before installation, and will have a splined slip joint provided.

8 TRANSMISSION
An Allison HD 4060P electronic 5-speed torque converting automatic transmission will be provided. Shift module is

mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation. A transmission temperature gauge with red light and buzzer will be installed on cab dash.

Ratios of the transmission are:

1st - 3.51 to 1.00
2nd - 1.91 to 1.00
3rd - 1.43 to 1.00
4th - 1.00 to 1.00
5th - 0.74 to 1.00
R - 4.80 to 1.00

The transmission will be furnished with a 5 year/100,000 mile warranty as provided by Allison Transmissions. This warranty will cover 100% parts and labor.

An external transmission oil cooler will be provided.

9 STEERING

Ross TAS-85 steering gear with integral heavy duty power steering will be provided. The power steering will incorporate a Vickers V20NF hydraulic pump with integral pressure and flow control. Vickers approval letter is located in the section of our proposal entitled "Bid Documents". The steering wheel will be padded and 20.00" in diameter.

The steering column will be a tilt and telescopic type. To aid in the steering of the apparatus, the front axle will be equipped with a Ross power assist cylinder.

10 TIRES

Front tires will be Goodyear radials 425/65R22.5, 18 ply highway tread mounted on

Rear tires (4) will be Goodyear radials 315/80R22.5, 18 ply mud & snow tread mounted on

Stainless steel wheel covers will be furnished on the front wheels, providing an appearance of chromed disc wheels.

One pair of stainless steel wheel covers, simulating the appearance of chromed wheels, will be furnished on the rear wheels including a full hub cover and chromed lug nut covers.

11 CAB (Totally Enclosed)

The cab is designed specifically for the fire service and

manufactured by the chassis builder out of high strength, corrosion resistant 5052 .125" aluminum welded to extruded aluminum framing.

The cab is designed and built entirely by Pierce Manufacturer within our facility.

The cab is 96.00" wide and has an approximate overall height of 106.00". The crew cab is constructed in such a manner that it totally encloses the fire fighter.

The cab will be a full-tilt design to allow easy maintenance to the engine compartment. The cab will be isolated from the chassis inputs by four rubber load cushions and will be tilted by a hydraulic pump connected to two cab lift cylinders. Cab will be locked down by a two point automatic locking mechanism that actuates after the cab has been lowered.

The cab and crew cab entrance steps will be enclosed and automatically drop down when the door is opened. The steps operate by a switch (air spool valve) on the cab door frame which is connected to an air cylinder which activates the step for both up and down operation. A dedicated air supply tank will be furnished for the step air cylinders to assure an adequate air supply for activation. All four cab step assemblies are of simplistic and identical design. Each step, when in the stored position, will be enclosed to protect the mechanisms from road debris and moisture. Each step assembly will be designed in a three step arrangement with each step spaced no more than 16.00" apart to provide easy cab entry and egress and will remain within the door sweep envelope. Each step surface will be a minimum of 160 square inches and the step surface will be constructed out of a non-slip and self-draining material.

A 20.00" slip resistant handrail is provided adjacent to all door openings for assistance. A rubber covered handrail will also be provided inside each front cab door adjacent to the door post.

Cab and crew cab doors will be approximately 32.00" wide by 61.00" high. Crew cab doors will be located on the side of the cab. Each cab door will be equipped with an automotive type

rubber continuous perimeter bulb seal on the door opening to insure a weather tight fit. The cab and crew cab doors are constructed of aluminum with a double pan design and contain a conventional roll down window. For enhanced lighting and visibility the upper area of each door will be contoured into the roof and include a contoured smoke glass feature. A flush mounted, chrome plated paddle type door handle will be provided on the interior and exterior. The door hinge is a stainless steel piano type with a .25" pin.

The cab and crew cab will be completely open to allow visual and audio communication between all fire fighters. The cab is designed to optimize room for all fire fighters. The flat floor area for the driver and officer shall is 21.50" wide (door to engine tunnel) and 28" front to rear (seat riser). The dimension from the back edge of the instrument panel to the officers seat back rest (with seat in rearmost position) is 36". The dimension from the back edge of the steering column to the drivers seat back (seat in rearmost) position is 30.00".

Inner fender liners in the wheel wells are provided. The outside rear wall of the crew cab is covered with a bright aluminum treadplate panel.

A large curved, safety glass windshield that is tinted will be provided that has over 4100 square inches for enhanced visibility. The cab windshield is installed by utilizing modern automotive techniques which includes bonding to the cab sheet metal with urethane adhesive and trimmed in rubber. All cab glass is tinted. Two (2) sun visors are provided - one above each windshield.

All cab glass will be tinted.

On each side of the crew cab, a window will be provided. An additional window will be installed above the side crew cab windows, and they will be contoured into the cab roof, and match the contour of the cab door's upper windows.

The cab and crew cab floor will be covered with a durable black rubber matting.

The rear wall of the crew cab will have two windows, each being 8.00" wide x 14.00" high.

been lowered.

The hydraulic cylinders will be equipped with a velocity fuse which protects the cab from accidently decending when the control is located in the tilt position.

MIRRORS
Deluxe full length, heated, west coast stainless steel mirrors with a 6.00" x 16.00" flat section will be provided and mounted on each cab door. The control for the mirrors will be located inside the cab.

CAB DOOR SCUFFPLATES
Polished stainless steel scuffplates will be installed on the inside of all cab doors, extending from the bottom of the door to 9.00" above the floor line.

12 BUMPER
A one piece stainless steel bumper, minimum of 10.00" high will be attached to the front of the frame with a 9.00" channel mounted directly behind it for additional strength. The bumper will be extended 19" from front face of cab. The area between bumper and cab will be fitted with bright aluminum treadplate to serve as a "gravel pan".

TOW HOOKS
Two chromed steel tow hooks will be installed under the front bumper and will be attached to the front frame members.

CAB INTERIOR
Cab dash will be padded and covered with 46 oz. leather grain vinyl resistant to oil, grease and mildew. Door panels will be covered with a high impact ABS plastic.
The cab dash fascias will be a wrap-around design to provide easy access of controls and shall be constructed out of high impact ABS plastic.

A vinyl headliner will be installed in both forward and rear cab sections. It will have a sound barrier as part of its composition. Material will be installed on aluminum sheet and securely fastened to interior cab ceiling. Forward portion of cab headliner provides easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.
A full width sun visor will be provided above each windshield.

They will be hinged at each end.

CAB HEATER/DEFROSTER
There will be a 40,000 BTU heater in the cab located behind the right side cab dash. The heater/defroster ventilation is built into the design of the cab dash instrument panel. The heater ducts are vented in a manner to provide heat directed towards the officer and driver. The defroster ducts are designed to provide maximum defrosting capabilities for the windshields. Adjustable defroster louvers will be provided for directing air flow to the side cab door windows. Heater/defroster controls are located on the cab dash within easy reach of the driver.

CREW CAB HEATER
A 50,000 BTU auxiliary heater is provided inside the crew cab for paassenger comfort. Controls are located on the heater.

ROOF VENT
For fresh air ventilation we will provide (2) manual roof vents installed in the crew cab ceiling.

SEATING
A Seats Inc. #911 air ride "Knee Action" seat will be provided in the cab for the driver.

A Seats Inc. #911 fixed companion seat will be provided in the cab for the officer. The seat will be equipped with an SCBA provision for a
bottle.

A radio compartment will be provided under the officer's seat. The compartment will be approximately 18.00" deep, 16.00" across and 5.00" high. A drop down door with a chrome plated lift and turn latch will be provided for access.

Seating inside the crew cab will consist of four Seats Inc. 911 companion seats. Two seats will be rear facing in the outboard positions directly behind driver and officer and two seats will be forward facing in the center position against the back wall of the cab.

AIR BOTTLE HOLDERS
The Seats Inc. 911 crew cab seats will be the SCBA type. Mounted in each backrest will be a Ziamatic Model KD-UH-6-SFPHS SCBA holder with a "knockdown" bracket and positive holding strap. The bracket is adjustable up and down by simply

unbolting, relocating and rebolting in desired position.

SEAT BELTS
Seat belts will be installed at all seat positions. All seat belts are provided with automatic retractors. Extensions are provided with all belts so that the male end can be easily grasped and the female end easily located while sitting in a normal position. Shoulder belts will be provided for drivers and officers seats.

INTERIOR
A rich looking interior is provided by painting all the metal surfaces inside the cab with a durable black vinyl texture paint and using stain and mildew resistant 46 oz. silver/gray crew cab seat upholstery. Seat covering material contains a sound absorbing layer.

EMI/RFI PROTECTION
The Pierce approach to electrical system electromatic compatibility (EMC) includes control of both emissions and susceptibility.

Pierce utilizes state of the art electrical system designs and components to insure that unwanted radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The apparatus proposed will have the ability to operate in the electromagnetic environment found in fire ground operations. Emission levels have been tested on similar apparatus and we can certify this vehicle to be in compliance with SAE J551 requirements.

EMI/RFI susceptibility is controlled by applying immune circuit designs, shielding, twisted pair wiring and filtering. Pierce electrical systems are designed for full compatibility with todays use of low level vehicle control signals and high powered 2-way radio communication systems. Careful attention is given to wire harness and cable routing to further minimize the potential for conducted and radiated EMI/RFI susceptibility.

13 STEP LIGHTS
A courtesy step light will be provided at each door opening actuated by automatcic door switches.

CAB CEILING MAP LIGHT
Two adjustable map lights with integral switches will be installed in the forward cab area mounted on the ceiling.

CAB DOME LIGHTS
A dome light will be installed in ceiling of the forward cab, centered and the light shall be actuated by automatic cab door switches.

Two ceiling mounted dome lights will be installed in crew cab area to illuminate seating area. The lights will have clear lenses and shall be wired to the cab door switches.

ENGINE COMPARTMENT LIGHT
One engine compartment light is installed under the engine hood with integral switch.

CAB INSTRUMENTATION
Cab instruments and controls are conveniently located within the forward cab section. Gauges and emergency vehicle switches are installed in removable panels for ease of service. The following gauges and controls are provided:

- Speedometer/odometer, electric (min. 4" dia.)
- Tachometer, electric (min. 4" dia.)
- Engine oil pressure gauge with red warning light and audible alarm
- Engine temperature gauge with red warning light and audible alarm
- Two air pressure gauges with red warning light and audible alarm
- Fuel gauge
- Ignition switch with green indicator light
- Starter control
- Heater controls
- Headlight switch

- Self canceling turn signal switch (arm) with visual and audio indicators. Audio indicator can be heard under normal non-emergency operation. Headlight dimmer switch is built into turn signal arm.
- Warning light switch control panel
- Parking brake control with red indicator light
- Horn button at center of steering wheel for dual electric horns
- Air restriction indicator light (amber) with audible alarm
- Hourmeter for engine
- Voltmeter with 2-stage high and low voltage red warning light and audible alarm.
- Low fuel indicator light, amber, and audible alarm
- Low coolant indicator light (amber) and audible alarm.

INDICATOR LIGHT AND ALARM PROVE-OUT
A system will be provided which will automatically test indicator lights and alarms located on the cab instrument panel when the ignition switch is activated. Provisions will be provided to allow a manual retest when the ignition switch is "on" and before the parking brake is released or the split-shaft PTO is engaged.

VOLTAGE MONITOR SYSTEM
A voltage monitor system will be provided to indicate the status of each battery system connected to the vehicle's electrical load. The monitor system will provide visual and audio warning when the system voltage is above or below optimum levels.

Two alarms stages will be provided. The first stage will activate intermittently if the system falls below 12.0 vdc or rises above 15 vdc. The second stage alarm will activate continuously if the system voltage falls below 11.0 vdc or rises above 16 vdc. Input voltages will be conditioned to avoid nuisance alarms.

SWITCH PANEL
The instrument panel controls and switches will be identified as to function by imprinted word(s) adjacent to the control. The required wording will be illuminated by "back-lighting", actuated by the headlight switch for after dark operation. Turn signal and high beam headlight indicator lights are also provided. To avoid confusion, warning indicators are (where possible) the "dead front" type, meaning the warning light and word identification of same does not show up unless it is necessary. This eliminates a complicated instrument panel so driver can keep his eyes and mind more on the road.

A built-in emergency light switch panel will have a master switch plus individual switches for selective control. The switch panel will be located in the "overhead" position above the windshield which will allow easy access for operation. The switches will be rocker type with integral indicator lights. The emergency switch controls will be located on the DRIVER PRIMARY side.
Instrument panel gauges, vehicle lights and other electrical accessories utilize proper sized wiring to accommodate expected current load. Wiring meets SAE J-1128 specifications for high temperature (250 degree F.) conditions and is number, color and function coded.

ELECTRICAL POWER AND SIGNAL PROTECTION AND CONTROL SYSTEM
A compartment will be provided in or under the cab to house the vehicles electrical power and signal circuit protection and control components. The power and signal protection and control compartment will contain circuit protection devices, power control devices, and a programmable logic controller. Power and signal protection and control components will be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray. Serviceable components will be readily accessible.

Circuit protection devices which conform to SAE standards will be utilized to protect each circuit. All circuit protection devices will be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type I Automatic reset (continuously resetting) and conform to SAE J553 or J258. PTO power circuits will be protected by Type III manual reset non-cycling circuit breakers conforming to SAE J553 or J258 which remain open until manually reset. When required, automotive type fuses

conforming to SAE J554, J1284, J1888 or J2077 will be utilized to protect electronic equipment.

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

A microprocessor based programmable logic controller will be utilized to control safety interlocks and vehicle system status indicators. In addition to visual status indicators, the logic controller will activate audible alarms designed to provide early warning of problems before they become critical. The programmable logic controller will include the following attributes:

- On-board self diagnostic input status indicators

- Automatic self-test on start-up with provision for manual activation

- Eliminate control logic relays wherever possible

- Provide logic control for NFPA 1901 mandated safety interlocks and indicators

- Utilize system intergration to eliminate redundant wiring and components

- Improve control system reliability by reducing relay and connector contacts

- Optically isolated inputs to eliminate transient electrical interference

- Customized control software programmed to reflect the vehicle's unique configuration

- Field re-programmable to accommodate changes

to the vehicles operating parameters

- Fully documented hardware and software

- Complete operating and trouble shooting manual

A diagram of the power and signal protection and control system will be provided inside the electrical compartment to allow immediate component identification.

ELECTRICAL SYSTEM ON-BOARD DIAGNOSTICS
On-board diagnostic indicators will be provided to support rapid trouble shooting of the electrical power and signal system. The diagnostic indicators will be located in a readily accessible area. A complete trouble shooting guide will be provided with the vehicle to assist with interpretation of the diagnostic signals.

POWER AND GROUND STUD
A 12 volt power stud and a grounding stud will be provided in the electrical component compartment for two-way radio equipment.

BATTERY SYSTEM
A single starting system will be provided, utilizing two 12 volt, 1400 CCA, 435 minutes of reserve capacity, high cycle, group 8D batteries with a system rating of 2800 CCA at 0 degrees F and 870 minutes of reserve capacity. An ignition switch and two (2) "Starter" buttons will be located on the instrument panel. The "Starter" buttons will be wired in parallel to a heavy duty solenoid. The second starter button is a safety back-up should the other button fail.

A master battery switch will be installed in a convenient location for the driver. An indicator light is provided on the instrument panel to notify the driver of the status of the battery system.

Batteries are placed on non-corrosive mats and stored in well ventilated compartments located under the cab. Heavy duty, 2/0 gauge, color coded, battery cables are provided. Battery terminal connections are coated with anti-corrosion compound. Battery solenoid terminal connections are encapsulated with semi-permanent rubberized compound.

The battery charging receptacle location will be adjacent to its respective battery (system). PUMP PANEL

14 ALTERNATOR

A C.E. Niehoff model N1223-2 alternator will be provided. It will have a rated output current of 250 amperes as measured by S.A.E. method J56. A custom three set point voltage regulator, manufactured be Niehoff, will be provided. The alternator will be connected to the power and ground distribution system with heavy duty cables sized to carry the full rated alternator output.

EXTERIOR LIGHTING

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

Front headlights are halogen, rectangular shape, one mounted in each front trim housing. The directional lights are a wrap around design in the same assembly as the headlight. The directional lights will wrap around on the outside corners of the trim housing.

Five clearance lights and marker lights are installed in the "eye brow" trim above the windshields.

WARNING LIGHTS (Cab Face)

A pair of Weldon Model 2020 rectangular red flashing lights will be located on the cab face. The lights will be mounted on stainless steel bezels located above the headlights.

MANUALS

The following parts, service and operation manuals will be provided:

One (1) illustrated parts manual for the pump and body. Parts description is of the expanded drawing type showing all component parts.

One (1) illustrated parts manual for the chassis. Parts description is of the expanded drawing type showing all component parts. Manual will be specifically for the chassis model purchased.

Two (2) chassis maintenance manuals containing parts & service information on major chassis components.

Three (3) illustrated chassis operation manuals.

Two (2) electrical wiring diagrams specifically prepared for the model of chassis and body provided.

ELECTRICAL

All electrical equipment will be installed to conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run in loom or conduit where exposed and grommets will be provided where the wiring passes through metal sheet. Automatic reset circuit breakers will be provided conforming to SAE standards. Wiring is color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at two inch intervals. Exterior exposed wire connectors will be positive locking and environmentally sealed to withstand a combination of elements including temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guide lines:

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

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

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

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

tion (of the plug).

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

(6) All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

All emergency light switches will be mounted on a separate panel installed in the overhead position. A master warning light switch and individual switches are provided to allow pre-selection of emergency lights. The light switches will be "rocker" type with an internal indicator light to show when switch is energized. Permanent identification of switches is accomplished by engraving their description on the panel.

All lights and reflectors required to comply with Federal Motor Vehicle Safety Standard #108 will be furnished. Rear identification lights will be recess mounted in the rear work platform flange for protection.

Lights and wiring mounted in rear fender panels are protected from damage by a false bulkhead inside the rear fender compartments.

All 120/240 volt electrical systems shall be tested as follows:

* Wiring and associated receptacles will be subjected to a 1 minute, 900 volt dielectric voltage withstand test with all switches in the circuit(s) closed between live parts, including neutral and the vehicle frame. This test will be conducted after all body has been completed.

* Electrical polarity checks will be conducted on all permanently wired equipment and receptacles to determine that connections have been properly made.

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

* Test results will be given to the purchaser at time

delivery.

OPEN DOOR INDICATOR LIGHT
Two red indicator lights will be provided and located in clear view of the driver to warn of an open passenger or equipment compartment door. One light will indicate the status of doors on the driver's side of the vehicle and the other will indicate the status of the passenger and rear doors.

CAB SPOTLIGHTS
Two Unity 225 spotlights, one each side at front of cab, will be provided. The spotlights will be furnished with 160,000 candle power halogen bulbs.

AIR HORNS
Two Grover chrome air horns will be provided. The horns will be piped to the wet tank utilizing .38" tubing with a pressure protection valve. A lanyard control for the air horns will be installed on the cab roof within reach of the driver. The siren will be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. A selector switch will be provided on the instrument panel so the driver will have the option to control the siren or the chassis horns from the horn button. The speakers will be recessed in the front bumper.

INTERSECTION LIGHTS
A pair of intersection lights will be located on the front outside corners of the extended front bumper and will be perpendicular to the vehicle. The lights will be red flashing, rectangular Weldon lights. A rocker switch will be provided inside the cab on the switch panel for actuation of the lights.

INTERSECTION LIGHTS
A pair of intersection lights will be located on the front outside corners of the extended front bumper and will be perpendicular to the vehicle. The lights will be red Whelen 97 Series Max-Beam with strobe bulbs. A rocker switch will be provided inside the cab on the switch panel for actuation of the lights.

15 WARRANTY - PAINT AND CORROSION
Vehicle exterior paint finish will be warranted against blistering, peeling, bubbling, lack of adhesion or any other manufacturing or material defect for a period of FOUR (4) YEARS PRORATED.

Period	Portion of Costs Covered
0 - 12 months	100%
13 - 24 months	100%
25 - 36 months	66%
37 - 48 months	33%

The unit will also be warranted against corrosion perforation for a period of TEN (10) YEARS.

A copy of our warranty is included with this bid.

16 Canadian daytime running lights will be installed on the chassis.

The aerial pedestal will be raised to accomodate the height of the cab.