FORM A: BID
(See B7)

1. Contract Title

SUPPLY & DELIVERY OF TRIPLE COMBINATION PUMPER FIRE APPARATUS VEHICLES

2. Bidder

_____
Name of Bidder

_____
Street

_____
City Province Postal Code

_____
Facsimile Number

(Mailing address if different)

_____
Street or P.O. Box

_____
City Province Postal Code

The Bidder is:

(Choose one)

☐ a sole proprietor

☐ a partnership

☐ a corporation

carrying on business under the above name.

3. Contact Person

The Bidder hereby authorizes the following contact person to represent the Bidder for purposes of the Bid.

_____
Contact Person Title

_____
Telephone Number Facsimile Number E-Mail address

4. Definitions

All capitalized terms used in the Contract shall have the meanings ascribed to them in the General Conditions and D3.

5. Offer

The Bidder hereby offers to perform the Work in accordance with the Contract for the price(s), in Canadian funds, set out on Form B: Prices, appended hereto.

6. Commencement of the Work

The Bidder agrees that no Work shall commence until he is in receipt of a notice of award from the Award Authority authorizing the commencement of the Work.

7. Contract

The Bidder agrees that the Bid Opportunity in its entirety shall be deemed to be incorporated in and to form a part of this offer notwithstanding that not all parts thereof are necessarily attached to or accompany this Bid.

8. Addenda

The Bidder certifies that the following addenda have been received and agrees that they shall be deemed to form a part of the Contract:

No. _____ Dated _____

_____ _____

_____ _____

9. Time

This offer shall be open for acceptance, binding and irrevocable for a period of sixty (60) Calendar Days following the Submission Deadline.

10. Signatures

In witness whereof the Bidder or the Bidder's authorized official or officials have signed this

_____ day of _____ , 20_____ .

Signature of Bidder or
Bidder's Authorized Official or Officials

_____

_____
(Print here name and official capacity of individual whose signature appears above)

_____

_____
(Print here name and official capacity of individual whose signature appears above)

FORM B: PRICES
(See B8)

SUPPLY & DELIVERY OF A TRIPLE COMBINATION PUMPER FIRE APPARATUS VEHICLES

UNIT PRICES

ITEM NO.	DESCRIPTION	SPEC. REF.	UNIT	APPROX QTY	UNIT PRICE	AMOUNT
1.	SUPPLY & DELIVERY OF TRIPLE COMBINATION PUMPER FIRE APPARATUS VEHICLES	**07058A**	Each	(10)	$_____	$_____
2.	EXTRICATION TOOLS - HAND OPERATED HYDRAULIC SPREADER TOOL, CUTTER TOOL WITH STORAGE BAG (AS DESCRIBED IN ARTICLE 31.36)	**07058B**	Each	(3)	$_____	$_____
3.	TECHNICAL SERVICE & PARTS MANUALS, CD PREFERRED	**07058**	Each	(1) Set	$_____	$_____

TOTAL BID PRICE (GST and MRST extra) (in figures) $ _____

(in words)_____

_____

_____
Name of Bidder

FORM N: DETAILED SPECIFICATIONS 07058

SUPPLY & DELIVERY OF TRIPLE COMBINATION PUMPER FIRE APPARATUS VEHICLES

(WFPS)

1.0 INTENT

1.1 It is the intent of these specifications to describe a front engine, rear wheel drive, triple combination pumper fire apparatus.

1.2 The triple combination fire apparatus, hereinafter referred to as **"Custom Build Unit"**, shall be 2007 or newer model as specified within this document. The apparatus shall be furnished complete and ready for use. Any parts not specifically mentioned but which are required to complete and place the apparatus in successful operation shall be furnished as though specifically mentioned in these specifications.

1.3 The ratings specified herein state the minimum values acceptable to the City, not implying that those values are sufficient for the design of the particular apparatus being bid.

2.0 STANDARDS

2.1 National Standards of Canada No. CAN/ULC-SS15-M88 and National Fire Protection Association Standard NFPA 1901 (current edition), with latest revisions, form an integral part of these specifications and any conflict with the specifications shall be brought to the attention of the Contract Administrator in Clause D4.1 of the Supplemental Conditions.

2.2 All applicable SAE standards form an integral part of the chassis specifications and shall have precedence in any conflict concerning minimum acceptable standards.

2.3 The apparatus shall comply with the Canada Motor Vehicle Safety Act and the Manitoba Highway Traffic Act.

2.4 Bidders shall include a written statement within 48 hours upon the request of the Contract Administrator, certifying that the apparatus being bid complies with all requirements of the standards referred to in this document. The Bidders shall also include Approval Drawings (general arrangement) depicting the vehicle's appearance from the left side, right side, front and rear elevation views. Drawings shall also depict location and arrangement of the pump controls scaled the same as the elevation views.

2.5 The chassis being supplied for the apparatus shall be the same model that has been tested to demonstrate that it meets the requirements European Crash Test Standards, **ECE R-29 Uniform Provisions Concerning the Approval of Vehicles With Regard to the Occupants of the Cab of a Commercial Vehicle**. The Bidder shall submit within (48) hours of the request of the Contract Administrator, proof of compliance with E.C.E. Reg. 29, including the test results, certified by a registered Professional Engineer and satisfactory to the Contract Administrator.

3.0 QUALIFICATIONS OF MANUFACTURER

3.1 The manufacturer of the apparatus shall have a minimum of five (5) years continuous experience manufacturing apparatus of the type being offered. The manufacturer shall have in effect a complete and documented quality control program ensuring compliance with all applicable standards.

Note: Bidders shall include within 48 hours upon the request of the Contract Administrator a detailed description of the manufacturer's experience and qualifications. A list of at least five (5) references for the type of apparatus being offered shall be included. The list shall include the fire department's name, location, contact person, telephone number and the length of time the apparatus has been in service.

3.2 The manufacturer of the apparatus shall have successfully demonstrated the operation of the type of apparatus being offered in cold weather (-40°C) conditions.

4.0 INSTRUCTIONS FOR COMPLETION OF SPECIFICATIONS

4.1 All items in these specifications must be answered indicating compliance or non-compliance. **Bidders shall state "yes" for compliance or state the deviation, or state the information requested**. All deviations shall be clearly stated and fully detailed.

4.2 Each bidder is required to fill in every blank. **Failure to do so may be used as a basis for rejection of bid.**

5.0 TYPE

5.1 Shall be a front engine, rear wheel drive, triple combination pumper fire apparatus. _____

- State make and model being bid. _____

6.0 PERFORMANCE

6.1 The apparatus shall be designed and built to operate on a continuous duty basis in the climatic conditions common to the City of Winnipeg. _____

Note: The City of Winnipeg has four seasons with ambient temperatures ranging from approximately 95°F (35°C) to -40°F (-40°C), with an average annual snowfall of approximately 42 in. (1070 mm). The apparatus when not in use will be stored in a heated building.

6.2 The apparatus shall be capable of carrying a driver and four (4) Fire Department personnel wearing protective clothing and gear, a full water and foam tank, and a full complement of fire fighting equipment and hose in a safe and efficient manner on an emergency response call. _____

7.0 GVWR, DIMENSIONS AND TURNING RADIUS

7.1 Gross vehicle weight rating (GVWR). _____

7.1.1 Gross axle weight rating (GAWR), front must be a minimum 10% greater than actual vehicle weight carried on front axle. _____

7.1.2 GAWR, rear must be a minimum 10% greater than actual vehicle weight carried on rear axle. _____

7.2 State the tare weight of the apparatus being bid:

- Front. _____
- Rear. _____
- Total. _____

7.2.1 State the weight distribution of the apparatus with the water and foam tanks filled: _____

- Front. _____
- Rear. _____

7.3 State the following dimensions:

a) Overall width – 102 in. (2591 mm) maximum.

b) Overall height – 122 in. (3099 mm) maximum.

Note: No part of the vehicle, including lights, shall exceed the maximum overall height specified.

c) Overall length – 35 ft. (10.7 m) maximum, state.

d) Wheelbase preferred – 183 in. approx, state.

e) Ground clearance – 8 in. (203 mm) minimum, state.

f) Approach and departure angle – nominal 10°.

7.4 State the vehicle turning radius, to-wall, measured as per SAE J695 – 35 ft. (10.7 m) maximum. Tighter turning radius is preferred.

8.0 ENGINE AND ENGINE EQUIPMENT

ENGINE AND ENGINE EQUIPMENT

8.1 Engine – 6-cylinder in-line diesel engine, Cummins. State make, model and horsepower. (Scan to be provided upon request before pre-build)

8.1.1 Engine horsepower – the engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance. All applicable power deductions and parasitic losses associated with the specified equipment shall be considered as required. Certification must be provided to demonstrate acceptable ratings and performance.

8.1.2 Engine location – over the front axle.

Engine governor – electronic, compatible with fire pumper (FRC) operation.

8.2 Oil drain plug – magnetic type.

8.3 Oil filter – as recommended by the engine manufacturer, full flow, spin-on filter. The filter shall be remote mounted such that it is easily accessible for servicing from underneath the vehicle. In parallel high efficiency bypass 2 – 20 micron.

8.4 Fuel filter, primary – as recommended by the engine manufacturer, spin-on filter, remote mounted on the chassis frame such that it is easily accessible for servicing.

8.4.1 Fuel filter, secondary (if recommended) spin-on filter. The filter shall be remote mounted on the chassis frame, easily accessible for servicing.

8.5 Starter – 12-volt electric. The starter shall be shielded from exhaust heat where required.

8.6 Air cleaner – heavy-duty replaceable element, dry type, as recommended by the engine manufacturer.

8.7 Emergency shutdown – air intake flap valve.

9.0 ENGINE COOLING SYSTEM

9.1 The engine cooling system shall be in accordance with the engine manufacturer's recommendations for front-engine fire pumper application and an ambient temperature range of 95°F (35°C) to -45°F (-43°C). The cooling system shall be of adequate capacity to maintain the coolant temperature within the recommended range during operation of the fire pump and under high ambient temperature conditions without the use of an auxiliary cooler. The coolant temperature shall not exceed 200°F (93°C) with the fire pump operating at maximum capacity for extended periods of time. The normal operating temperature of the coolant system shall be approximately 180°F (92°C).

9.2 Radiator – pressurized type with surge tank or coolant recovery system. _____

9.3 Fan drive – thermostatically controlled fan clutch, viscous type or air clutch. _____

9.4 Coolant – ethylene glycol based coolant protected to -35°F (-37°C) compatible with the engine. _____

9.4.1 Coolant filter – spin-on type, as recommended by the manufacturer. _____

9.5 Hoses – as recommended by manufacturer. _____

9.5.1 Hose clamps – spring loaded, constant torque type. _____

10.0 ELECTRICAL SUPPLY SYSTEM

10.1 12-Volt automotive style electrical supply system. _____

10.2 Batteries – Group 31S 760 maximum CCA, Severe duty batteries. The total battery CCA shall be rated at 3 CCA per cubic inch of engine displacement. (Max. 6 batteries) _____

10.2.1 Battery location – batteries shall be located in a corrosion resistant battery tray within close proximity to the engine. The batteries shall be protected from road spray. Preferable location – back end of cab, battery tray mounted on top and across the frame. Within cab battery access requested.

10.2.2 Battery cables – 3/0 gauge, colour coded welding type cable, with connector ends crimped, pull tested and sealed with heat shrink tubing at all connections. _____

10.3 Battery charging system – on-board system with a 0-20 Amp rated (preferred) automatic charger for charging of the batteries from an external 120-Volt power supply. _____

10.3.1 Charging system plug-in – automatic ejector type with a 20 Amp receptacle mounted on the front of the apparatus body on the left side, 60 to 80 in. (1524 – 2032 mm) above ground level.

10.4 Ground wire – the electrical wiring harness shall have a dedicated ground wire running the full length of the truck. Weather tight junction boxes shall be provided at the dash, pump panel and the rear of the truck. This ground wire shall be connected directly to the battery negative post. All electrical systems shall be grounded to this ground wire. The total resistance of this ground wire shall not exceed 0.2 Volts drop at any point with all circuits turned on. The conventional grounding system using the frame shall be maintained. _____

10.5 Alternator – minimum Niehoff 270 alternator with compatible 8 grove belt drive system to match full load capacity. The regulator shall be remote mounted and away from heat

sources. The alternator shall be shielded from heat sources where required. The alternator output capacity shall be sufficient to match and/or exceed vehicle full load demands at 11% duty cycle.

10.6 Power disconnect – power to all electrical systems shall be wired through a power disconnect system with the master switch or switches located in the cab for operation by the driver. The system shall be designed to prevent alternator damage in the event that the master switch is placed in the off position while the engine is running.

- State details of the power disconnect system.

11.0 FUEL SYSTEM

11.1 Fuel tank – approximate 50 Imp. Gallons (227 L) capacity.

11.2 Fuel transfer pump is required. Pump is to be external to fuel tank, back flow checked and in line with fuel supply line.

12.0 EXHAUST SYSTEM

12.1 Horizontal muffler and exhaust, aluminized or stainless steel.

12.2 Tailpipe – located on the right side of the apparatus, suitable for use with an exhaust extraction system. The tailpipe shall be 90° to the rub rail, shall extend a minimum of ½ in. (13 mm) beyond the rub rail and shall be 3 in. (76 mm) below the rub rail. Hanger brackets shall be a minimum of 18 in. (457 mm) from the rub rail.

Note: The tailpipe configuration is intended for use with a “Plymovent” automatic exhaust disconnection system and shall include the installation of the appropriate adapter.

Note: Dependant on engine and emission requirements the exhaust system shall be rationalized at pre-build meeting. It would be preferred if the exhaust system (muffler) could be enclosed within under slung pump winter pan.

13.0 TRANSMISSION (SCAN required)

13.1 Transmission shall be an Allison automatic transmission as determined and recommended by the SCAN. State make and model being bid.

13.1.1 Torque converter – as recommended by the Manufacturer.

13.1.2 Direct drive lockup for pumping operation.

13.2 Shifter – as recommended by the Manufacturer.

13.3 Transmission oil filter – as recommended by the Manufacturer.

13.4 Drain plug – magnetic type.

13.5 Oil level dipstick – easy access steel ribbon bayonet type with high and low level markings.

13.6 PTO opening – required.

13.7 Transmission output retarder – c/w an in cab, driver's area, on/off selector and shall be brake pedal activated. Degree of retardation shall be modulated by degree of brake application. The greater the degree of brake pedal application, the greater the degree of retarder application.

14.0 DRIVE SHAFTS

14.1 Drive shaft Preferred Spicer 1810 Series drive shafts with Glidecoat splines. However; engine/transmission SCAN and OEM recommendations shall advise best suited match..

14.2 Adequate clearance shall be provided to allow greasing of the drive shaft U-joints from underneath the vehicle.

15.0 AXLES AND SUSPENSIONS

15.1 Front axle – Meritor, 18,000 lbs. capacity minimum c/w oil lubricated wheel bearings. Axle to exceed actual load carried by 10% minimum. State make and capacity.

15.2 Front suspension – Ridewell air ride suspension to best match front GAWR. Comes with individual levelling valve for each air spring. State make and model bid.

- Ridewell and or equal.

15.3 Shock absorbers, front – heavy duty, double acting.

15.4 Rear axle – Meritor single speed axle, 23,000 lbs. capacity minimum. Axle to exceed actual load carried by 10% minimum. State make and capacity.

15.4.1 Drive ratio – for approximately 62 mph (100 km/h).

15.4.2 Differential drain plugs – magnetic type.

15.4.3 Differential vent – remote vent. Vent to c/w 10 micron breathable filter, water/dust cap and check valve.

15.5 Rear suspension – Ridewell air ride suspension with capacity to best match GAWR. Comes with levelling valve for each spring. State make and model bid.

16.0 WHEELS AND TIRES

16.1 Front wheels – polished aluminium hub piloted, 10 bolt.

16.2 Front tires – Michelin, 315/80R 22.5 20PR XZA1 equal or better.

16.3 Rear wheels – polished aluminium hub piloted, 10 bolt.

16.4 Rear tires – Michelin 11R22.5 16PR, XDN2 equal or better.

16.5 Spare wheel & tire – one (1) wheel and tire to match front wheel and tire.

Note: Spare wheel & tire to be shipped loose.

17.0 BRAKE SYSTEM

17.1 Full air service brake system with spring loaded parking brakes and an anti-lock system.

17.2 Antilock braking system – comes with roll stability control, Meritor/Wabco four channel systems, providing independent antilock braking control at four wheels and traction control at rear drive wheels.

17.3 Drum brakes – Meritor outboard drum brakes front and rear.

17.4 Slack adjusters – Meritor automatic type.

17.5 Parking brake – spring set parking brakes on rear service brake system.

17.6 Air lines – colour-coded, reinforced nylon tubing.

17.7 Air compressor – water cooled, pressure lubricated compressor, minimum 16 cfm capacity. The compressor air intake shall be plumbed into the engine air intake after the air cleaner.

17.8 Air dryer – heated, spin-on desiccant type.

17.9 Moisture ejector – heated, automatic, in wet tank only.

17.10 Drain valves – cable operated, in each air tank except the wet tank. The cables shall be vinyl coated and shall terminate at the bottom edge of the cab or at the rub rail on the body.

17.11 Auxiliary air reservoir – nominal 1200 in^3 (20 L) air reservoir to operate the vehicle air horns and to function as an emergency parking brake release. A dash mounted control, located directly below the main parking brake release, shall allow the air in the reservoir to be used to release the parking brakes. The control shall be non-detented, spring return type such that it cannot be left engaged in the brake release position.

17.12 External air inlet – plumbed to the inlet side of the air dryer such that the air brake system can be charged from an outside source without starting the engine. A check valve shall be located in the inlet line. The air inlet shall be a 3/8 in. (9.5 mm) NPT male fitting, capped, and shall be located on the left side of the chassis cab.

17.13 Air line sources – all air lines shall be sourced after the air dryer.

17.14 Kussmaul pump plus 1000 with compressor required – on-board air compressor for maintaining pressure in the air reservoirs when the vehicle is parked in a fire hall. Electrical power for the compressor shall be provided through the charging system plug-in (see 10.3.1).

18.0 STEERING

18.1 Hydraulic power steering.

18.2 Steering column – tilt and telescopic type.

18.3 Steering wheel – padded type.

19.0 FRAME

19.1 Steel channel rail frame designed and constructed to match the GVWR and the

application of the vehicle as a triple combination pumper fire apparatus.

19.1.1 Resisting bending moment combined for both frame rails minimum 3,300,000 in.-lbs.

19.2 Front frame extension – bolt on as required for 19.2.1.

19.2.1 Trash hose storage compartment – approximately 21" x 12" x 12" deep, to accommodate 75 ft. of 1¾" hose with nozzle, c/w aluminium cover, located in front bumper extension. (To be discussed at pre-build meeting)

19.3 Front bumper – polished stainless steel bumper bolted to the chassis frame.

19.3.1 Corner indicators – blaze orange, flexible sight rods, approx. 24 in. (610 mm) high.

19.4 Front tow hooks – two (2) hooks or eyes, bolted to the chassis frame. A crossmember shall be located in the chassis frame at the tow hook location (use of the front bumper as a crossmember is not acceptable).

19.5 Rear tow hooks – two (2) hooks or eyes, bolted to the chassis frame. A crossmember shall be located in the chassis frame at the tow hook location. The tow hooks shall be easily accessible.

20.0 CAB AND CAB EQUIPMENT

20.1 Four-door, fully enclosed, low entry cab over design, five (5) person minimum crew cab with forward facing seating to accommodate a medical supply cabinet accessible externally from both sides. The Medical compartment shall contain backboard, scoop stretcher and medical equipment storage.

Note: The City of Winnipeg will except alternate cab configurations for the storage of backboard and the scoop stretcher although there will be **No exemption** for the in cab Medical storage compartments.

Note: Bidders shall supply (within 48 hours of the request of the Contract Administrator) a drawing showing the cab interior layout and relevant dimensions.

20.1.1 Construction – 5052-H32 marine grade aluminium or equivalent. State material.

20.1.2 Insulating material to prevent galvanic corrosion shall be provided at all possible areas of contact between aluminium and steel. The insulation material used shall be nonporous.

20.2 Cab interior – minimum 141 inches long c/w 20' raised roof. The cab interior shall be of sufficient height for an average Firefighter to stand erect in the rear portion of the cab. The cab minimum width of 87'/ fixed tinted glass windows shall be located in the front, sides and rear of cab as permitted by the highway traffic act. The front raised portion of cab shall not be provided with windows. Minimum cab interior length – 141 inches.

20.3 Entrance doors – two (2) per side.

20.3.1 Door opening height, front door – maximum height of cab (determined by structural requirements of manufacturer).

20.3.2 Door opening height, rear door – maximum height of cab (determined by structural requirements of manufacturer).

20.3.3 Door handles / latches, exterior – as recommended by manufacturer.

20.3.4 Door handles / latches, interior – flush-mounted, paddle handle type, located such as to prevent accidental actuation.

20.3.5 Door latch striker pins – recessed such as not to protrude into the door opening area.

20.3.6 Door hinges – as recommended by manufacturer.

20.3.7 Weather stripping – automotive style.

20.3.8 Entry assist handles – grab handles as per NFPA standard.

20.4 Entrance steps – front and rear entrance steps designed for ease of entry and exit. The entrance steps shall provide a low entry step height with the bottom steps no more than 20 in. (559 mm) above ground level. Step shall be a minimum 22 in. (559 mm) wide. The step surfaces shall be non- slip material, nominal 10 in. (254 mm) deep to ensure a safe stepping area for firefighter in turnout boots.

20.4 Rear entrance steps – designed to allow personnel to step out of the cab in a forward position. Step surfaces shall be nominal 10 in. (254 mm) deep to ensure a safe stepping area for firefighters in turnout boots. The location of the rear entrance steps shall be such as to provide adequate floor space between the step wells and the outboard rear seats to allow seated personnel to rest their feet at floor level.

20.5 Step width, rear doors – 20 in. (508 mm) minimum.

20.5.1 Step area lights – LED recessed, side mounted light in each entrance step area. The lights shall be activated by door switches.

20.6 Seats – all seats shall be Seats Inc. Model 911 with grey, heavy-duty vinyl (preferred) upholstery. Modura cloth inserts must be approved by the Contract Administrator to be acceptable.

20.6.1 Drivers seat – conventional high-back, fully adjustable air suspension seat upholstered in grey Mordura.

20.6.2 Officer's seat – fully adjustable air suspension seat with a Zico walkaway SCBA bracket complete with parade pad.

20.6.3 Air supply for the seats shall be taken from the auxiliary air reservoir.

20.6.4 Rear seats – three (3) forward facing seats are preferred located along the back of the cab. These rear seats shall be equipped with Zico walkaway brackets complete. (Quik-Lock model QLM-U)

Note: Zico walkaway brackets for the officer's and rear seats shall be compatible with 45 minute high pressure M.S.A. air bottles and S.C.B.A. harness.

20.6.5 Seat belts – three-point, retractable type for all seats.

20.7 Floor covering – heavy-duty rubber floormat, or approved equivalent.

20.8 Intercom - Each seating position shall be equipped with an intercom and headphones that allows for conversation between personnel in the cab and monitoring of the department radio. The driver and officer in the front seats shall have the capability to send and receive on the department radio.

20.9 Insulation – full insulation and vinyl padding package for walls and ceiling. Insulation

shall be non-hygroscopic, mildew proof and fire retardant. Vinyl shall be grey, heavy-duty automotive type.

20.9.1 Floor insulation – as required to meet HVAC needs and acceptable sound suppression requirements.

20.10 Headliner – grey, heavy duty vinyl with padding.

20.11 Windows – tinted safety sunglass for all windows including windshield.

20.11.1 Door windows, rear doors – fully opening roll-up windows or sliding type windows.

20.12 Window fans – if recommended by the manufacturer to assist in defrosting the windows, four (4) auxiliary defroster fans with metal blade guards and individual switches. Two (2) located at the front windshield and two (2) in the rear section. A master power switch for all fans shall be provided on the driver's switch panel. (Note 20.15).

20.13 Sun visors – full windshield interior sun visors. Two (2) swivel visors. One positioned in the front of the driver and officer. These visors swivel to provide coverage of the front door windows. A centre visor or glare reducing windshield design fills in the gap that is found between the two outer visors.

20.14 Mirrors, exterior – Velvac low-mount chrome finish mirrors c/w convex mirror built into the mirror head, electric defroster with driver operable remote controls.

20.15 Front heater and air conditioner-(Heating/Ventilating/Air Conditioning System) high output, fresh air type with multi-speed fan, controlled by the driver. Outlets shall be provided at dashboard level and in the driver's and officer's foot area to ensure occupant comfort when heat is required. Defroster outlets shall be provided to defrost entire windshield and the drivers and officers side windows. Coolant flow (preferred) in the heater circuit shall be passively controlled by a dash mounted heat control device. The system/s shall meet or exceed the BTU's required to heat/cool the cab for the temperatures common to the City of Winnipeg, i.e., -35° C, to +35°C.

20.15.1 Rear heater and air conditioner shall meet or exceed the BTU requirements necessary to ensure floor area heating and cooling the rear of the cab to ensure occupant comfort and shall be separately controlled from the front of the cab.

Note: The Heating/Ventilation/Air Conditioning systems (front and rear) shall dehumidify the air in the defrost mode to assist in preventing the fogging or frosting of the windows due to excess humidity from wet firefighter clothing.

20.16 Dome lights – LED minimum four (4) lights, two (2) in the front and two (2) in the rear portion of the cab to fully illuminate the cab interior. All lights shall be operated by door switches. Each light shall be equipped with an individual switch at the light.

20.17 Instrumentation – full instrumentation on a removable or flip down panel, or pull-out gauges.

20.17.1 Metric instrumentation shall include, but not be limited to:

a) Speedometer / odometer – metric.

b) Tachometer.

c) Oil pressure gauge.

d) Coolant temperature gauge.

e) Transmission oil temperature gauge or warning light.

f) Low oil pressure / high water temperature warning light(s).

g) Voltmeter.

h) Fuel level gauge.

i) Air reservoir pressure gauge(s).

j) Engine hour meter.

k) Air cleaner restriction indicator gauge.

l) Engine oil filter bypass indicator lights.

m) Fuel filter bypass indicator lights.

n) Transmission filter bypass indicator lights if recommended.

20.18 Ignition switch – keyless type.

20.18.1 Doors – shall be keyed alike.

20.19 OEM engine warning system.

20.20 Radio – AM/FM stereo, mounted inside of dash, controlled by the driver.

20.21 Provision shall be made for installing data terminal and AVL system.

20.22 Medical Compartment – shall be located rear of engine through the cab at 90º to the frame rails. There shall be exterior access only right and left sides. The compartment doors shall be lockable c/w adjustable dividers. Design to be dependant on cab, configuration, equipment and dimensions.

21.0 FIRE PUMP AND ASSOCIATED EQUIPMENT

21.1 Waterous or Hale Fire pump– mid-ship factory mounted, single stage centrifugal fire pump with a rated capacity of 1500 (US) GPM @ 150 psi (6635 L/min @ 10.3 Bar).

21.1.2 Pump overheat protection system – thermal relief valve with automatic reset, complete with panel mounted warning light.

21.1.3 Relief valve system shall provide discharge and suction protection (against excess pressures), control located on pump operator's panel.

Note: Inlet relief valve to be plumbed to drain when pump not in use, c/w manual drain if required.

21.2 Priming pump – Trident air primer.

Piping – all intake and discharge piping shall be sized to meet or exceed the flow capacity corresponding to the intake and outlet discharge size, taking into account flow loss (resistance) due to valves, elbows, port openings, etc. All pipes shall be corrosion resistant, minimum schedule 40, stainless steel, butt welded continuous length pipes.

21.2.2 Valves – all intake and discharge valves shall be sized to meet or exceed the flow capacity corresponding to the intake or discharge size. 4 in. valves may be either gate or piston type with 30° elbow, c/w pressure relief valve. Valves 3 in. (76 mm) or larger shall be slow opening type, meeting NFPA requirements. Valves less than 3 in. (76 mm) shall be manually controlled. Valves shall be Akron ball valves. Unless otherwise specified, all valves shall be controlled from the pump operator's panel. Minimum valve sizes at various locations are specified herein.

21.2.3 Suction relief control valve – shall be pressure governed.

21.2 Pump intakes – intakes shall be provided as follows:

INTAKE LOCATION	***QTY***	***SIZE***	***THREAD TYPE***	***GATED***
Left Side Pump Panel	1	6 in. (152 mm)	National Standard (Male)	Yes
Right Side Pump Panel	1	6 in. (152 mm)	National Standard (Male)	Yes
Tank-to-Pump Line	1	3 in. (76 mm)	N/A	Yes
Right Side Pump Panel	1	4 in. (102mm)	Storz	Yes

21.2.1 The 6 in. (152 mm) intakes shall be located to provide sufficient clearance for hard suction lines. The left intake shall be equipped with a Hale MIV or equivalent, removable strainers and 6 in. to 4 in. storz reducer and suction intake drain. Two (2) 6 in. blind caps with T-handles shall also be supplied.

Note: Storz cap shall be attached to all storz inlets and outlets with vinyl coated, stainless steel cables or an approved alternative.

21.2.2 The tank-to-pump line shall be insulated from the water tank to the pump enclosure. A flexible or victaulic coupling in the line shall prevent transmission of pump vibrations to the tank.

External tank fill intake – intake shall be provided as follows:

INTAKE LOCATION	***QTY***	***SIZE***	***THREAD TYPE***	***GATED***
Left Side Pump Panel	1	2 ½ in. (64 mm)	Western Canada (Female)	Yes

The intake shall be plumbed into the pump-to-tank fill line such that the tank can be filled from an external source without flooding the pump. The valve for the intake line shall be a manually controlled Akron ball valve with the control handle for the valve located at the pump panel adjacent to the intake. The intake shall be labelled "tank fill" and shall be equipped with a

cap with a vinyl coated, stainless steel cable or an approved alternative.

Pump discharge outlets – discharge outlets shall be provided as follows:

DISCHARGE OUTLET LOCATION	***QTY***	***SIZE***	***THREAD TYPE***	***GATED***
Right Side Pump Panel	1	4 in. (102 mm)	Storz	Yes
Right Side Pump Panel	1	2½ in (64 mm)	WCT (Male)	Yes
Rear, Left	1	4 in. (102 mm)	Storz	Yes
Rear, Right	1	2½ in (64 mm)	WCT (Male)	Yes
Transverse (Cross Lay) Area	2	1½ in. (38 mm)	National Standard (Male)	Yes
Transverse (Cross Lay) Area	1	2 ½ in. (64mm)	WCT (Male)	Yes
Front bumper	1	1½ in. (38 mm)	National Standard (Male)	Yes
Rearward of Transverse (Deluge)	1	4 in. (102 mm)	National Standard (Male)	Yes
Pump-to-Tank Fill Line	1	1½ in. (38 mm)	National Standard (Male)	Yes

21.2.3 The piping for the right and rear 4 in. (102 mm). Storz discharge outlets sized to achieve rated flow capacity of outlet. State.

21.2.4 The valves for the right and rear 4 in. (102 mm). Storz discharge outlets sized to achieve rated flow capacity of outlet. State.

21.2.5 The piping for the 1¾ transverse and front outlet shall be 2 inches. (51 mm) minimum.

21.2.6 The piping for the 2 ½ transverse outlet shall be 2 ½ inches. (64mm) minimum.

21.2.7 The valves for the 1 ¾ transverse and front outlet shall be 2 inches. (51 mm) minimum.

21.2.8 The valve for the 2 ½ transverse outlet shall be 2 ½ inches. (64mm) minimum.

21.2.9 The rear discharge outlets shall be located suitable for pre-connected 4 in. (102 mm) and 2½ in. (64 mm) hose. The piping shall be routed outside the water tank. The outlet height shall be suitable for use from ground level. The outlets shall be equipped with 30° sweep 4 in. storz elbow and cap, c/w automatic drain valves.

21.2.10 The 1½ in. (38 mm) and 2 ½ inch (64mm) discharge outlets in the transverse (crosslay) area shall be equipped with chicksan swivel joints located in the forward crosslay area, partially recessed in the centre of the transverse floor such as to prevent the fire hose from kinking when pulled in either direction. The swivel joints shall lay flat and shall not swivel below floor level.

21.2.11 The vertical discharge outlet shall be located immediately to the rear of the transverse hose bed. The outlet shall be adequately sized for use with the monitor specified herein (see 21.6).

21.3 Monitor – 3578 Stream Master Electric Monitor with 1577 SaberMaster

Nozzle, mounted on the vertical discharge outlet with 360° rotation without hitting the cab with the water steam. The remote control for the monitor shall be located on the pump operator's panel and supplied with a 15 ft. cord.

21.4 Drain valves – individual or ganged manual ball valve, located in the lowest section of all discharge and intake piping that is not equipped with automatic drains and in the pump to completely drain the entire system. Drain valves shall be minimum ¾ in. (19 mm) diameter. The controls for all manual drains valves shall be located near the drain valve outlet and shall be appropriately labelled.

Pump compartment – fully enclosed on all sides including the bottom. The bottom portion of the enclosure shall be a removable, bolt-on, 3/16 in. (5 mm) aluminium pan constructed with a 2 piece loose fitted aluminium panel. All discharge, intake and drain valves in the pump area shall be located inside the pump compartment.

21.4.1 Swing-out pump panels – the right and left side pump panels shall be minimum 14 ga. stainless steel, designed to permit easy removal without disassembly of any pumps, gauges, controls, inlets, outlets, drains, lighting or electrical componentry. Trim plates, located behind the main pump panels, shall be used to provide a well sealed pump panel and a clean appearance. The trim plates shall be easily removed when the main pump panel is removed.

21.4.2 Access panel – a large access panel to the pump compartment shall be provided. The panel shall be easily removable and permit sufficient access to pump and valving for repairs.

21.5 Pump compartment heater – shall be diesel fired heaters, suitable to prevent freezing of the pump and plumbing. The heater shall be located to be protected from damage and water spray. The heater shall be thermostatically controlled and shall be equipped with an on/off switch, located for convenient operation on the pump operator's panel.

22.0 <u>PUMP DRIVE</u>

22.1 The pump shall be driven via a split shaft PTO with a single speed transfer case.

- State make and model of transfer case being bid.

22.2 Shifting mechanism – air or electric powered shift mechanism with a manual override.

- State details of shift mechanism.

22.2.1 Shift control – located in the cab for operation from the driver's position. The shift control lever shall have a positive locking feature or protective cover to prevent accidental disengagement.

22.2.2 Warning lights – two warning lights at the shift control and one light at the pump operator's panel, in accordance with N.F.P.A. requirements, shall indicate when the transfer case shift to pump operation has been completed and the transmission is in pump gear.

23.0 PUMP OPERATOR'S PANEL

23.1 Location – left hand side. The control panel shall be located behind a full length and width roll-up door (Amdor or equivalent). The LED rope lighting shall illuminate the entire pump panel without causing glare for the operator. _____

23.2 The pump operator's panel shall contain the following controls, gauges, warning lights, etc.:

a) Pump drive engagement light. _____

b) Pump overheat warning light. _____

c) FRC Incontrol pressure governor or equal capable of automatically maintaining a desired preset discharge pressure within a range of 0-2756 kpa. Logic for the governor system shall be incorporated into the electronic control module. The system shall be designed so that it can only be operated after the fire pump has been engaged and the vehicle parking brake set. A pump cavitation protection feature shall also be tied into the governor system. An engine remote throttle feature to be part of this system allowing the operator to select engine speed from low to high idle when not pumping. (metric required) _____

d) Transmission oil temperature gauge with warning light and buzzer. _____

e) Priming control. _____

f) Water tank level gauge, FRC or Akron digital tank level gauge. _____

g) Combination gauge: master discharge and intake pressure gauge, and flow gauges. FRC. _____

h) Valve controls – control handles for operation of each gated pump intake and discharge outlet. Manually operated valves shall have lock type control handles with linkage connection to valves. _____

i) Discharge combination pressure gauge and flow meters. An analogue pressure gauge and flow meter (FRC) shall be provided for each discharge outlet excluding the pump-to-tank fill line and shall be located above the respective control valve. The approved gauges/meters shall be calibrated in accordance with the manufacturer's recommendation. _____

j) Foam system controls and display. _____

k) Foam tank level gauge – FRC, digital tank level gauge. _____

l) PTO shift control display. _____

m) Monitor remote controls. _____

n) Heater controls – for pump compartment heater.

23.3 Panel plate – stainless steel plate with slots for the valve control handles. The slots shall be fully sealed using flexible rubber boots. _____

23.4 Name plates – color coded, metal name plates, block lettered in English, for all controls, gauges, warning lights, etc. _____

23.5 ULC or equivalent, test plate – located on or immediately above the pump operator's panel. The plate shall show discharge flows and pressures in SI units (L/min, kpa). _____

23.6 Bidders shall include a diagram illustrating the control panel layout. _____

24.0 WATER TANK

24.1 Construction –polypropylene construction. _____

24.1.1 Baffles – longitudinal and transverse baffles as recommended by the manufacturer to prevent excessive water movement and reaction. _____

24.2 Capacity – approximately 500 Imp. gallons (2257 L). (Discuss weight and distribution at pre-build) _____

24.3 Fill tower-top access filler, easily identified and utilized by the user. The top of the fill tower shall be approximately even with the top of the appar atus body side. The fill tower cover shall be clearly labelled "water only". _____

24.3.1 Overflow vent – located to drain directly to ground, clear of any chassis and driveline components. _____

24.4 Sump – located in the front of the tank such as to allow use or draining of the total tank capacity. The drain function shall be activated from the left side at the rub rail. _____

24.4.1 Outlet fitting – 3 in. (76 mm) NPT female flange fitting for the tank to pump line, located in the front of the sump. An anti-swirl device shall be provided on the inside of the sump at the outlet. _____

24.5 Fill line fitting – 2½ in. (64 mm) NPT female fitting for the pump-to-tank fill line. A deflector shield inside the tank shall direct the water flow when filling. ********** _____

24.6 Mounting – the tank shall be securely mounted in such a manner as to allow the tank to float sufficiently to prevent damage due to chassis frame movement including twisting. The tank shall be supported along its entire perimeter by a steel cradle bolted to the chassis frame. The cradle shall be lined with ¼ in. (6 mm) thick rubber at all points of contact with the tank. _____

24.7 Lift eyes – threaded bosses for attaching lift eyes for removal of the tank shall be built into the top of the tank. _____

24.8 Water tank warranty – 20-year minimum. _____

25.0 FOAM SYSTEM

25.1 Foam system – electronic, direct injection, foam concentrate proportioning system with Class "A" foam capability, Foam Pro System 2002 preferred. State make and model. _____

25.2 Foam system is to be installed as per manufacturer's instruction and must be capable of supplying the lines indicated in 25.5. _____

25.3 Foam injector – located in the outlet manifold to supply foam concentrate to both 1½ in. (38mm) crosslays, trash line and to the 2½ in. (64mm) crosslay _____

outlet.

25.4 Controller – digital display/controller located at the pump operator's panel.

25.5 Foam tank – minimum 30 Imp. gallons (136 L) capacity tank, designed specifically for foam system use. The foam tank shall be securely mounted or an integral part of the water tank.

25.6 Fill tower – top access filler, located adjacent to the water tank fill tower. The fill cover shall be equipped with a latch, easily operated by a mitted hand, and may be held in the open position without the use of a prop rod. The top of the fill tower shall be even with the water tank fill tower. The fill tower cover shall be clearly labelled "A FOAM ONLY" and shall positively seal when closed. A fill line inlet for the remote fill system shall be provided.

25.7 Remote fill system (Foam Pro) – pumping system for filling the foam tank from ground level. The system shall have a pumping capacity of approximately 12 (US) gallons (45 L/min) and shall be capable of drafting foam solution directly from 5 gallon pails, 55 gallon drums or any other large foam tank. The remote tank fill inlet shall enter the foam tank at the bottom of the foam tank. All components of the system shall be compatible with Class "A" foam solutions.

25.8 Quick connect fitting – located at the right side pump panel, for attachment of the remote fill hose.

25.10 Remote fill hose – 72 in. (1829 mm) hose with quick connect end, located next to the quick connect fittings behind a glomb lock door. The hose shall be stored in a storage tube that slopes down and is open at the lowest point.

26.0 APPARATUS BODY

26.1 Type – Rescue style, heavy-duty style body, 5083-H321 salt water Marine Grade aluminium or equivalent. State material.

Note: Aluminium body on steel sub frame shall not be acceptable.

26.2 Rub rail – extruded aluminium rub rail, bolted in place and located along the lower edge of the body, both sides non conductive.

26.2.1 All compartment floors and shelves shall be 3/16 in. (5 mm) marine grade aluminium, minimum, welded continuous.

26.3 Insulating material to prevent galvanic corrosion shall be provided at all possible areas of contact between aluminium and steel. The insulation material used shall be nonporous.

26.4 Rub rail – extruded aluminium rub rail, bolted in place and located along the lower edge of the body, both sides.

26.5 Drip mouldings – located above all compartment door openings.

26.6 Storage compartments – located along each side and rear of the body as shown in appendix. The storage compartments shall provide a combined interior volume of approximately 155 ft^3 (4.39 m^3) with compartment sizing

approximately as listed below:

L1, L3, R1 and R3 - 34" W x 68" H x 26" D
R2 - 56" W x 38" H x 14" D
L2 - 56" W x 38" H x 26" D
Rear E1 - 42" W x 50" H x 30" D

Note: Bidders shall include a body layout drawing showing compartment locations and dimensions. All measurements are approximate and are not intended to preclude manufacturer recommendations.

Note: Discuss all compartments at pre-build.

26.6.1 Compartment design – all compartments shall have louvered vents for ventilation. All compartments shall have sweep-out style compartment bottoms with the front edge lower than the floor level such that the bottom edge of the compartment door when closed is approximately 1 in. (25 mm) below the compartment floor level.

26.6.2 Compartment doors – Amdor or equivalent roll-up doors lock/lifting bars c/w door ajar warning circuit. All compartment doors shall have anodized aluminum slats.

26.6.2.1 "Door ajar" warning circuit to indicate an open storage compartment door with a nominal 2 in. (51 mm) diameter flashing red warning light located in the cab.

26.6.3 Compartment lights – LED rope lighting in each compartment to the right and left of opening, full length of opening. The lights in each compartment shall be activated by the opening of each compartment door. One master switch for all these compartment LED lights shall be located within the cab for ease of driver's reach.

26.6.4 Shelves – all compartment shelves shall be 3/16 in. (5 mm) aluminum and shall cover the full width of the compartment. Shelves shall be lined with an interlocking matting, dry-deck or equal.

26.6.5 Slide-out trays – all slide-out trays shall be 3/16 in. (5 mm) aluminum with heavy-duty steel sliders, with ball bearing rollers capable of supporting a minimum capacity of 500 lbs.. The slide-out trays shall have paddle-handle type latches with dual point locks or dual T-handle type latches. The trays shall lock in the open and closed positions.

26.6.6 Left side, front compartment (L1) – equipped with a slide-tool board to accommodate shovels, wrenches, axes pry bars and other tools.

26.6.7 Left side, horizontal compartment (L2) – equipped with one (1) adjustable shelf.

26.6.8 Left side, rear compartment (L3) – left side, front compartment (L1) – equipped with a slide-tool board to accommodate a Ram Fan GF-165 smoke ventilator (see 31.1) in the lower portion of the compartment. The smoke ventilator shall be securely mounted but easily removed without the use of tools. The slide-out tray shall be capable of sliding fully out of the compartment. A fixed shelf shall be mounted at mid-height in the compartment. A vertical divider shall be mounted below the fixed shelf to partition the smoke extractor storage are from the remaining area in the

lower portion of the compartment Right side, front compartment (R1) – equipped with one (1) adjustable shelf.

26.6.9 Right side, rear compartment (R2) – equipped with one (1) adjustable shelf.

26.7 Ladder storage – one Zico, 12 volt electrically operated mounted overhead ladder rack shall be installed on the right hand side of the body. The ladders shall be lowered to approximately 60' from ground level. A safety transmission interlock system is required such that the transmission can only be shifted into drive mode with the Zico ladder storage assembly in the stowed position.

26.8 Ladders shall be:

One (1) 3 section, 30 ft..
One (1) 14 ft. roof ladder.

26.8.2 SCBA storage – minimum 4 SCBA high pressure 45 minutes cylinder storage pods within rear wheel well fenders. The pods shall be equipped with weather tight doors c/w slam locks.

26.9 Rear step – NFPA compliant 18 in. (457 mm) deep, full width rear step area. The step height shall be maximum 22 in. (559 mm) above ground level. Step surfaces shall be non-slip, enclosed on the underside. Drain opening shall be provided to facilitate cleaning of the non-slip surfaces.

26.10 Hose bed access steps – located to allow personnel to climb from the rear step onto the hose bed. Step surfaces shall be aluminum grip strut.

26.11 Handrails – NFPA handrails, located to assist in access to hose bed.

Note: Proposed handrail and step dimensions and locations shall be submitted to the City within 48 hours of the request of the Contract Administrator.

26.12 Stanchions – located at the upper rear corners of the hose bed for mounting warning and deck lights.

26.13 Wheel wells – equipped with full liners 5083-H321 salt water marine grade aluminum wheel fender and liner.

Note: Fire hose shall be supplied within the apparatus.

26.14 Checker plate – the rear of the apparatus body, the front corners and the area immediately above the wheel wells shall be covered with polished aluminum checker plate.

27.0 HOSE BED

27.1 All hose bed dividers shall run longitudinally.

27.1.1 The hose bed shall have a flat bottom of removable vinyl or aluminium

slats, except where otherwise specified, and a smooth interior, free of any projections such as bolts, brackets, etc., which may damage the fire hose.

27.1.2 Hose bed loading (floor) height – maximum 84 in. (2134 mm) above ground level.

27.2 The hose bed shall have a flat bottom of removable vinyl or aluminium slats and a smooth interior free of any projections such as bolts, brackets, etc., which may damage the fire hose. The hose bed dividers shall be adjustable partitions running full length front to back.

a) Space on the left for 1000 ft. of 4 in. (102 mm) high volume rubber covered fire hose.

b) Space on the right-centre for 800 ft. of 2½ in. (64 mm) double jacket, rubber lined fire hose.

c) Centre walkway -slip resistant walkway required from the rear of the apparatus to the front of the hose bed (at the water and foam fill towers) nominal width 24 in. (610 mm) wide.

d) Command Light – CL605 or equivalent

Note: Fire hose shall be supplied with the apparatus.

27.2.1 Grab handles – required at the rear of the centre walkway to the left and right side. The handles shall allow for a clear walkway and shall not interfere with the hose.

27.3 Hose bed cover – heavy duty tarps to completely cover the hose beds and not interfere with hose deployment. The cover/s shall be durable waterproof and flame resistant material (preferably red in colour). The cover shall be able to be secured in the open or covered position and remain in place under severe conditions.

28.0 TRANSVERSE (CROSSLAY) AREA

28.1 The transverse (crosslay) area shall be located ahead of the hose bed and deluge standpipe.

28.1.1 The transverse area shall be covered by checker plate aluminium panels (lids), hinged at the front. A rubber ball and socket, friction fit type locking device shall be used to secure each lid in the down position. The lids shall not interfere with the operation of the deluge gun or fill tower lids when in an open or closed position.

28.2 Hose capacity – the transverse area shall provide sufficient space for two (2) crosslays of 200 ft. (4 x 15 m) each, of 1¾ in. (44 mm) double jacket, rubber lined fire hose. A centre divider shall separate the two (2) crosslays. The forward crosslay shall be pre-connected to the discharge outlet in the centre of the transverse floor (see 21.7). The transverse shall be large enough to hold the specified hose and pistol grip-nozzles.

One 2½ in. crosslay immediately to the rear of the two 1¾ in. The crosslay should be able to hold 4 x 15m length of 64 mm double jacket rubber lined fire hose and a pistol grip nozzle.

28.3 Transverse floor – sloped approximately 5° downward towards the centre from each side, and lined with removable vinyl or aluminium slats.

28.4 Guide rollers – full length, stainless steel rollers mounted along the bottom and sides of the transverse opening on each side of the apparatus.

28.5 Running boards – running board/step located along the bottom of the pump panel on the left and right side of the apparatus for access to the crosslay. The running boards shall be minimum 10 in. (254 mm) deep and shall not protrude beyond the width of the apparatus body. The outer edges of the running boards shall have extruded aluminium rub rails matching the body rub rails. The step surfaces shall be non-slip, enclosed on the underside. Drain openings shall be provided to facilitate cleaning of the non-slip surfaces.

28.5.1 Flip out steps extension required on right side, designed to facilitate loading and removal of crosslay hose.

28.5.2 Handrails – aluminium or stainless steel handrails with rubber grip inserts, located on the left side, right side and below the crosslay area, on each side of the apparatus.

29.0 ELECTRICAL SYSTEMS, GENERAL

29.1 All electrical wiring harness shall be encased in pre-engineered weatherproof loom. All harness connections shall be weather tight connections. Each circuit shall be colour coded and/or marked the entire length. The marking shall be easy to read. Individual wires shall be multi-strand copper with cross linked polyethylene insulation. Maximum volts drop in any electrical wiring circuit shall not exceed 0.5 volts at highest operating temperature within normal working range.

29.1.1 All wiring shall be in pre-engineered harnesses with weatherproof, guided pinsnap-together connectors. Each circuit shall be colour coded and marked the entire length of the wire with easily read numbers and/or letters for identification. Wires shall be minimum 16 ga., multi-strand copper with cross-linked polyethylene insulation.

29.1.2 Where crimp-on type electrical connectors are necessary, the connectors shall be fastened to the wiring, pull tested to 40 lbs., then sealed using heat shrink tubing.

29.1.3 Any soldered connections shall be performed using flux core solder, then sealed using heat shrink tubing. Acid and/or acid core solder shall not be used.

29.1.4 All wiring shall be properly secured and routed. All holes required for routing shall be grommetted and sealed as required.

29.2 Circuit breakers shall be used in lieu of fuses for all circuits requiring overload protection (reset type circuit breakers preferred).

All circuit breakers and relays shall be located behind quick removable panels, located to be readily accessible for servicing. All circuit breakers and relays shall be labelled to indicate their function.

29.3 The electrical distribution panels for the apparatus body shall be located

in an easily accessible location for the maintenance people to access. The panels shall have a removable weather tight front cover. The dedicated ground cable shall have a ground terminal in these panels with sufficient connection point available for all circuits.

30.0 VEHICLE LIGHTING AND WARNING EQUIPMENT

30.1 The apparatus shall be equipped with all vehicle lighting equipment required under the Canada Motor Vehicle Safety Act and the Manitoba Highway Traffic Act. _____

30.2 The apparatus shall have an LED optical warning system that meets and exceeds NFPA 1901. _____

Note: Bidders shall include a list of all optical warning devices, and their respective mounting locations, being supplied on the apparatus.

30.2.1 Light bar (LED only) – clear lens, located on the front of the cab roof mounted ahead of 20' raised roof section. Individual switches shall be provided for the alley lights if included in the light bar. _____

Note: LED lights shall be directed to front and sides only. Back of front light bar shall not be equipped with lighting. Individual switches shall be provided for alley included in light bar. _____

30.2.2 Rear warning lights – as per NFPA 1901 Standards (current edition). _____

30.2.3 Red flashing lights front two (2). _____

30.2.4 Red flashing lights rear two (2). _____

30.2.5 Intersection lights – two (2) in the side at the front bumper area, two (2) in the rear wheel well area and two (2) in the rear tail board area. _____

30.2.6 Arrow stick – LED, c/w controller. The arrow stick shall be mounted in the rear of the body below the hose bed. _____

30.2.7 Scene lights – 12 Volt Halogen, located on right and left sides and rear to provide adequate scene lighting. _____

30.3 Load management system – an automatic electrical load management system shall be provided. State make and model. _____

Note: bidders shall include a list of all optical warning devices and their respective locations. _____

30.4 Taillights – LED _____

30.5 Turn signals – LED as per C.M.V.S.S. plus side-mounted turn signals located approximately midway of vehicle, as per NFPA 1901 (current edition). _____

30.6 Wig wags – alternately flashing headlights operating on high beam only.

30.7 Deck lights – two (2) swivel mounted deck lights, located on the stanchions above the place of the rear beacons.

30.8 Siren – siren system with two (2) speakers with mounted in the front bumper, spaced as wide apart as possible. _____

30.9 Warning lights and siren controller. The controller shall be mounted with the arrow stick controller mounted to the right of the driver for primary operation by the driver from the normal seated position. The officer's position shall be equipped with a siren tone control switch. This switch when activated shall only be able to change siren tones of siren wail, yelp and electronic air horn. It will not select stand by or on/off selection. The switch position shall be to the left of the officer.

30.10 Air horns – two (2) air horns mounted in the front bumper. The air horns shall be operable from the driver's position via the steering wheel horn activator and from the officer's position via a toe switch.

30.11 Back-up alarm – electronic, self-adjusting (87-112 dB) type.

30.12 Spotlight – 12-Volt, heavy duty hand held spotlight with momentary switch, dash mounted in the officer area.

31.0 FIRE FIGHTING EQUIPMENT

The following equipment shall be supplied as part of the apparatus and shall be mounted where applicable. Items not available (in section 31) at time of delivery, shall be supplied and installed **within 30 days** after delivery.

Note: Location of equipment to be determined at pre-build.

31.1 16" electrical variable speed PPV blower, (Tempest preferred) min. CFM 11,000 12/2 cord with 20 amp twist lock plug complete with 15 meters 10/2 cold weather rated cord with 20 twist lock ends.

31.2 Ground Ladders:

a) One (1) 30 ft. (9.1 m) 3-section extension ladder, Duo-Safety 1200 Series.

b) One (1) 14 ft. (4.3 m) roof ladder with folding roof hooks, Duo-Safety 1200 Series.

c) One (1) 10 ft. (3.0 m) folding (attic) ladder, Duo-Safety 585-A Series.

d) One (1) Little Giant ladder Type 1A model 17.

31.3 Pike Poles:

a) One (1) 6 ft. (1.8 m) fibreglass pike pole with "D" handle.

b) One (1) 8 ft. (2.4 m) pike pole with fibreglass handle.

c) One (1) 4 ft. (1.3 m) fibreglass pike pole with "D" handle.

31.4 Axes – two (2) 6 lb. (2.7 kg) two pickhead fire axes with fibreglass handles.

31.4.1 Axe mounting brackets – Zico or equal, required for each axe. Bracket locations to be determined.

31.5 Sledgehammer – one (1) 10 lb. (4.5 kg) sledgehammer with fibreglass handle.

31.5.1 Sledgehammer mounting bracket – Zico or equal. Bracket location to be determined.

31.6 Prybars:

a) One (1) 50 in. (1270 mm) crow bar.

b) One (1) Kelly tool.

c) One (1) set of Irons tools with carrying strap.

d) Three (3) 24 inch goose neck pry bars.

31.6.1 Pry bar mounting brackets – Zico or equal. Bracket locations to be determined.

31.7 Shovels:

a) One (1) square mouth shovel.

b) One (1) No. 10 scoop shovel.

31.7.1 Shovel mounting brackets – Zico or equal. Brackets to be mounted in the compartment L2 on the upper shelf.

31.8 Salvage Covers – four (4), light weight approx. size 12 ft. x 14 ft.

31.9 Extinguishers:

a) One (1) 2½ gal. (11 L) stainless steel pressurized water extinguisher supplied with pump to pressurize.

b) One (1) 15 lb. (6.8 kg) BC rated CO_2 extinguisher.

c) One (1) 20 lb. (9.1 kg) BC rated pressurized dry chemical extinguisher.

31.9.1 Extinguisher mounting brackets – Zico or equal. Bracket locations to be determined.

31.10 Door opener – one (1) hydraulic powered door opener with hand pump, prybar, hammer and carry bag, Rabbit Tool by Hurst Jaws of Life (no substitutes).

31.11 Nozzles:

a) Two (2) 2½ in. (64 mm) WCT Akron Model 4825 nozzles. (500-1100)

b) One (1) 2½ in. (64 mm) WCT Akron Model 2393 Axial play pipe with stacked tips.

c) Four (4) 1½ in (38 mm) Akron Model 4820 Assault nozzle with pistol grip (350-550.)

d) One (1) 1½ in (38 mm) Akron Model 1720 Turbojet nozzles with pistol grip (500)

e) One (1) 1½ in. (38 mm) nozzle, Akron style 4715, (350-550)

f) One Akron 777 quick attack foam tube.

31.11.1 Nozzle mounting brackets – neoprene rubber, Zico or equal, required for each nozzle. Bracket locations to be determined.

31.12 Valves:

a) One (1) light weight, ball valve water thief, Akron style 1573, 2½ in. (64 mm) female swivel Western Canada thread x one 2½ in. (64 mm) male Western Canada thread and two 1½ in. (38 mm) male National pipe thread, with protective caps on male threads.

b) 2 (2) 2½ in. (64 mm) hydrant gate, Akron style 2285, Western Canada thread.

c) One Akron 2582 4" stortz to 3 x 2½ WCT male valve c/w thread protectors and mount.

31.12.1 Valve mounting brackets – Zico AWG or equal, required for each valve. Bracket locations to be determined.

31.13 Wye – 1 () 2½ in. (64 mm) WCT x two (2) 1½ in. (38 mm) male Western Canada thread wye, Pyrolite, with protective caps on male threads.

31.14 Adapters:

a) two (2) 2½ in. (64 mm) double male adapters, Akron style 336 – Pyrolite, Western Canada thread.

b) two (2) 2½ in. (64 mm) double female swivel adapters, Akron style 335 – Pyrolite, Western Canada thread.

c) Two (2) 4 in. (102 mm) Storz x 2½ in. (64 mm) male Western Canada thread adapter, with protective cap on male thread.

d) Two (2) 4 in. (102 mm) Storz x 2½ in. (64 mm) female swivel Western Canada thread x 30°, 4 in. (102 mm) Storz adapter.

e) Two (2) 2½ in. (64 mm) Western Canada thread male to 1½ in. (38 mm) NPT female adapter, Pyrolite or brass.

f) Two 6" hydrant to 4" stortz swivel hydrant adaptor.

31.14.1 Adapter mounting brackets – Zico Quic-Mount or equal. Bracket locations to be determined.

31.15 Portable monitor – demountable, portable monitor with tip-over protection, Crossfire TFT or equal, complete with 4 in. (102 mm) single Storz inlet, 2499 quad stacked tips and stream straightener (minimum 18 in. (457 mm) long).

Note: Stream straightener and quad stacked tips shall be adaptable to

Akron monitor (see 21.6).

31.16.1 Portable monitor compartment storage bracket – required. Mounting brackets shall also be required for the stream straightener and tips. Bracket locations to be determined. _____

(Task Force Tips Inc., 2800 E. Evans Avenue, Valparaiso, Indiana, 46383, Tel: (219) 462-6161). _____

31.17 Hose –13 lengths of 1¾ in. hose yellow in colour coupled with 1½ in. NSPT (Mercedes Aqua flow Plus, no substitutes) _____

31.18 one (1) 75 ft. 1¾ in. rubber trash line yellow in colour (Mercedes Futureline).

31.19 Twelve (12) 64 mm hose (Mercedes Aquaflow) yellow in colour coupled WCT _____

31.20 Eight (8) 100mm X 33 M Angus Hi-Vol Storz

31.21 One (1) 100mm X 11M Angus Hi-Vol Storz _____

31.22 Two (2) 44mm X 2 M Aqua Flow Plus

31.23 One (1) 64mm X 2M Aqua Flow _____

31.24 Stihl Rescue Saw c/w one (1) 12 in. 24 tooth carbide blade, one (1) 14 in. metal blade and one (1) 14 in. concrete blade. _____

31.25 Lennox Hacksaw c/w 3 blades. _____

two (2) ECR-10-4500cord reels with Beta 4500 light and gang box (20 amp twist lock female) complete with 50 ft. 12/2 cold weather cord with 20 amp twist lock male _____

31.26 One (1) set of wheel chocks. (mounted) _____

31.27 30 in. bolt cutter. _____

31.28 Three (3) Akron #78 ladder straps _____

31.29 one (1) Akron 2443 triple wrench holder w/wrench holders .
31.30 Two (2) combination Storz wrenches with mount
31.31 Two (2) combination Stroz wrenches loose _____

31.32 One (1) hose clamp.(manual able to accept 4 inch hose) _____

31.33 Hydraulic generator 7 Kilowatt minimum. _____

31.34 Hanney electric cord reel with one hundred feet 10/2 cold weather cord with a gang box with four outlets.

31.35 Four (4) Energizer Hard Case Lanterns. With batteries _____

31.36 One (1) Bullard T3 Max Hand Held Thermal Imaging Camera and truck mount charger complete with retractable strap and emergency alkaline battery pack. _____

EXTRACATION TOOLS- (Refer to Form B Prices item # 2, spec ref. 07058B)

1 hand operated hydraulic spreader tool
1 hand operated hydraulic cutter tool (Storage bag for each)

GENERAL:

The tools must be capable of withstanding a static over-load pressure of twice the working pressure. This 2:1 ratio over-load ratio is a requirement to provide maximum safety to the operator. The tool must be a "one person' operated light weight tool, which means that one person will be able to position, guide and operate the tool without the assistance of other people. For this reason, the tool must be equipped with a carrying handle that allows the operator to keep the tool evenly balanced I all positions, even with one hand.

The tools must be activated by means of a pump handle. The pump handle must be located in such a way that it can be operated, guided and supported easily by right and left handed operators without having to change the position of the hands even when wearing gloves. The pump handle must be able to swivel into various positions with a locking device pin to hold the pump handle in place. This will enable the operator to change the handle into a comfortable position while working in a confined area. Under no circumstances is the spreader/cutter assemble to rotate on the hydraulic tool to place the tool into a comfortable position.

Hydraulic rescue tools must be warranted for the lifetime of the product and must be free of defects in material and workmanship. This does not include normal wear and tear of normal tool operation.

Miscellaneous Tools

1 WSWSKC73 Multitool Kit (Acklands)
1 100' extension cord 12/2 (20 amp twist lock plugs)
2 12" 12/2 adapter (20 amp twist lock female to 15 amp u ground male)
2 12" 12/2 adaptor (15 amp u ground female to 20 amp twist lock male)
1 1 gallon gas can metal with built in spout
1 2 gallon gas can metal with built in spout
1 braid on braid 150' utility rope w/ bag
1 metal folding hose key
1 bracket for oxygen D cylinders
2 poly bush fire backpacks (folding)
1 WSW3-155 tool sets (or similar)(Acklands)
1 tool box with, 18' pipe wrench, 12" crescent wrench, full set best quality screw drivers, vise grip pliers, cable cutters, full pliers set(will advise)
1 bracket for oxygen D cylinders
1 FRC Jack strap

32.0 SERVICEABILITY

32.1 All components of the apparatus requiring regular scheduled servicing or lubrication shall be easily accessible.

32.2 The design and construction of the apparatus shall be such that the removal of drive train components including, but not limited to, the engine,

transmission and transfer case, can be accomplished without dismantling the apparatus body.

33.0 COLOUR

33.1 The apparatus shall be painted as follows:

33.1.1 Cab – painted two tone, with bottom half red to match Dupont C8053U (Candy Apple Red) and top half white to match Dupont DU 1300 (Super White), using a polyurethane enamel paint. (DuPont Imron or Sikkons paint)

33.1.2 Apparatus body – painted red to match the bottom half of the cab.

33.1.3 Apparatus body compartments, interior – painted with a light grey, scratch resistant, automotive grade paint.

33.1.4 Chassis frame, axles, etc. – painted using smooth black corrosion resistant paint.

33.2 All paint shall be applied in accordance with the paint manufacturer's recommendations. All surfaces shall be properly cleaned, prepared and primed with a suitable primer prior to painting. Painting shall have been performed in an atmosphere controlled spray booth.

33.3 The cab and apparatus body shall have been painted with all trim and hardware removed. All mounting holes shall have been drilled and deburred and nutserts shall be installed in blind holes prior to painting.

33.3.1 Any caulking of body seams shall be performed prior to painting. Caulking material shall be of the highest Industry standards.

33.3.2 The apparatus body roll-up doors shall be anodized. (See 26.6.2).

33.4 Reflective striping – all reflective striping shall be 3M 4000 diamond grade striping where ever possible. The reflective striping shall be red on white and/or aluminum background and white on red background. The side striping shall be stylized Z pattern front to back of vehicle. The striping shall be composed of 5 bands. The band width shall be 10'. Example: white stripe on red background. From top down shall be: one 1' white stripe, one 1' red stripe, one 6' white stripe, one 1' red stripe, one 1' white stripe. The stripes shall not be spaced apart to reveal background. The stripe shall be edge sealed as per 3M guidelines. Incorporated within the cab reflective stripe shall be stylized WFD. Cab drivers and officers door shall be location of Winnipeg Fire Department crest (size 12 ¾ 'x 12' wide) crest shall be within reflective stripe. Were 4000 diamond grade reflective striping is difficult to apply; series 680 reflective film shall be allowable Example: on roll up door slats. The reflective striping shall at all times meet and/or exceed NFPA 1901 as the minimum standard guideline.

33.4.1 The reflective striping on the cab rear entrance doors shall incorporate the Fire Department's stylized "WFD" logo. (A diagram of the logo shall be provided to the Contractor by the City).

33.5 The cab interior shall be charcoal grey.

34.0 NOISE LEVELS

34.1 The sound level in the cab at all seated positions shall not exceed 80 dB(A), measured in accordance with SAE J336, with the apparatus traveling at any speed up to governed speed with the sirens off and doors and windows closed. _____

- State the sound level in the cab. _____

35.0 DELIVERY

35.1 All equipment shall be delivered F.O.B.; freight prepaid, to the Fleet Management Agency, 185 Tecumseh Avenue, Winnipeg, Manitoba. **Five of the Fire Apparatus units shall be delivered no later than two-hundred and forty (240) calendar days from the date of the award of the contract. The remaining Five Apparatus units shall be delivered no later than three hundred (300) calendar days from the date of award of the contract.** _____

A Manitoba Vehicle Safety Inspection shall be performed on the apparatus prior to delivery. A valid decal shall be displayed and a safety certificate shall be provided. _____

36.0 MANUALS

36.1 Manuals supplied under this contract shall be in English and shall be specifically for the apparatus supplied and in electronic form. General purpose manuals are not acceptable. The manuals shall cover the complete equipment including all components thereof. _____

The following manuals shall be supplied under this contract. The manuals shall be supplied at the time of delivery of the apparatus.

a) Operator's manuals – two (2) sets in total. _____

b) Parts and service manuals, including detailed wiring schematics and preventative maintenance schedules – two (2) sets in total. _____

Note: The wiring schematics shall identify the location of all relays, switches, etc.

36.2 Diagnostic tools: Genesis diagnostic system and software with most recent updates. Modem and data logger to be supplied on all units. Diagnostics shall be on engine, transmission, ABS brakes and multiplex electrical system, etc. _____

37.0 TRAINING

37.1 The Supplier shall provide at their expense, detailed operational and maintenance training to EVT certified staff and Academy personnel. The training shall be conducted in separate sessions for each group of personnel. Each session shall be sufficient in duration and shall provide adequate familiarization and orientation on the apparatus, to the satisfaction of the Contract Administrator. The training shall be conducted

in Winnipeg at a location to be designated by the Contract Administrator.

- DVD training aides are required on the care, maintenance and operations of the apparatus.

38.0 PERFORMANCE RELIABILITY

38.1 The responsibility for the design of the complete apparatus, its performance and reliability shall rest upon the Contractor.

38.2 The term *"repeated failures"* as determined by the Chief or designate, as used herein is defined to mean that the same component, subassembly, or assembly develops repeated defects, breakdowns and/or malfunctions rendering the apparatus inoperative, or requiring repeated shop correction, service and/or replacement during the warranty period applicable for said component, subassembly, or assembly. Minor items or ordinary service adjustments are not included, or considered under the scope of "repeated failures", as well as other factors, such as operational damage due to accidents, misuse or lack of proper maintenance, service and lubrication attention by not following the manufacturer's preventative maintenance schedule.

38.2.1 Where the apparatus develops "repeated failures" in service, the Contractor shall make any necessary engineering changes, repairs, alterations or modifications in order to guarantee reliability of performance, at no cost to the City with a reapplied, full warranty.

39.0 WARRANTY

39.1 Further to GC.10.01, the warranty on the apparatus shall include 100% replacement parts and labour at no cost to the City and shall cover the complete equipment and all parts thereof against any defects of workmanship, construction and materials for three (3) years from the effective date of the Certificate of Total Performance except as detailed in D10.

39.1.1 A new three (3) year warranty period shall be provided for any article that is repaired or replaced under the terms of the "repeated failures" clause The new warranty period shall be effective from the date of acceptance of the repaired or replaced article.

39.2 The apparatus is of vital importance to the City in providing essential services and, accordingly, all warranty items brought to the attention of the Contractor by the City shall be rectified expediently. The City reserves the right to affect warranty repairs to the apparatus, at full cost to the Contractor, should the Contractor fail to perform in a timely manner.

In the case where the Bidder proposes that warranty work be performed by a third party or by the City of Winnipeg Fire Paramedic Service, the Bidder shall include a written detailed estimate with the bid. Any work performed by the Fire Paramedic Service Mechanical Services Branch shall be charged to the Contractor at the Branch's shop rate in effect at the time the work is performed. The City reserves the right to reject any bid where the proposal for warranty work is deemed unacceptable by the Supervisor of the Emergency Mechanical Services Branch.

39.4 In the case where the Contract Administrator and the Bidder have

determined that the repair time will be in excess of five (5) calendar days, the Bidder shall supply a unit for use, equivalent to the one being offered during the downtime period at no cost to the City. In the case where the Contractor is unable to supply a similar unit to the City of Winnipeg during this downtime period, the Contractor shall be responsible for all costs including all incidental costs incurred by the City for the temporary supply from a third party. _____

40.0 PARTS AVAILABILITY

40.1 The Contractor shall have an established dealer/representative located within 10 km of the boundaries of the City of Winnipeg. _____

40.1.1 The Contractor's Winnipeg dealer/representative shall stock parts required for regular servicing, as outlined in the manufacturers service and maintenance manual. _____

40.2 The Contractor shall be responsible to ensure that regular servicing parts are made available to the City of Winnipeg within a forty-eight (48) hour period. _____

40.3 In order to ensure a minimum downtime of the equipment, the Contractor shall maintain a stock of all replacement parts in North America, either in his/her own inventory or in that of an agency that normally supplies parts to the Contractor and shall be made available to the City of Winnipeg within a five (5) day working period, consistent with the essential service requirements of the apparatus. _____

41.0 LITERATURE

41.1 Bidders shall submit current descriptive, detailed literature within forty-eight (48) hours of the request of the Contract Administrator. _____