PART A

TENDER SUBMISSION

FORM A: TENDER
(See B7)

1. Project Title — **ERROR! REFERENCE SOURCE NOT FOUND.**

2. Bidder

_____
Name of Bidder

_____
Street

_____
City Province Postal Code

(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

4. Definitions

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

5. Offer

The Bidder hereby offers to perform the Work in accordance with the Contract for the Unit Price(s), in Canadian funds, set out on FORM B: PRICES, appended hereto.

6. Subcontractors

The Bidder agrees that, if he subcontracts any portion of the Work, he shall employ only Subcontractors who have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, or who are fully capable of performing the Work required to be done in accordance with the terms of the Contract.

7. Contract

The Bidder agrees that the Tender Package 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 Tender Submission.

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 ninety (90) 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_____ .

Signed and sealed in the presence of:	Signature of Bidder or Bidder's Authorized Official or Officials
_____ (Witness)	_____
	_____ (Print here name and official capacity of individual whose signature appears above)
_____ (Witness)	_____
	_____ (Print here name and official capacity of individual whose signature appears above)

SEAL

FORM B: PRICES
(See B8)

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UNIT PRICES

ITEM NO.	DESCRIPTION	SPEC. REF.	UNIT	APPROX. QUANTITY	UNIT PRICE	EXTENDED AMOUNT
1	100 Foot Rescue Ladder Platform Fire Truck	03042	each	1	$ _____	$ _____
2	Thermal Imager	03042	each	1	$ _____	$ _____
3	100 foot, 13/4 inch (45mm) Jump Line c/w Pistol Grip Nozzle	03042	each	1	$ _____	$ _____
4	50 foot lengths of 13/4 inch (45mm) c/w two (2) Pistol Grip Fog Nozzles	03042	each	8	$ _____	$ _____
5	50 foot lengths of 21/2 inch (65mm) Hose	03042	each	10	$ _____	$ _____
6	50 foot lengths of 5 inch (125mm) Hydrant Connection hose	03042	each	6	$ _____	$ _____
7	Penetrating Piercing Nozzle	03042	each	1	$ _____	$ _____
8	Water Thief-2 1/2 to 2X 1 1/2 and 1X 2 1/2 gated	03042	each	1	$ _____	$ _____
9	4 inch (100mm) to 2 1/2 inch (65mm) Gated “Y”	03042	each	1	$ _____	$ _____
10	Double Male 2 1/2 inch (65mm) Adapters	03042	each	2	$ _____	$ _____
11	Double Female 2 1/2 inch (65mm) Adapters	03042	each	2	$ _____	$ _____
12	4 inch (100mm) to 5 inch (125mm) Storz Adapters	03042	each	2	$ _____	$ _____

FORM B: PRICES
(See B8)

ERROR! REFERENCE SOURCE NOT FOUND.

UNIT PRICES

ITEM NO.	DESCRIPTION	SPEC. REF.	UNIT	APPROX. QUANTITY	UNIT PRICE	EXTENDED AMOUNT
13	4 inch Storz to 3 ½ inch Male Adapters	03042	each	1	$ _____	$ _____
14	2 1/2 inch (65mm) to 1 ½ inch (38mm) Reducer	03042	each	1	$ _____	$ _____
15	Hose Hangers	03042	each	3	$ _____	$ _____
16	2 1/2 inch (65mm) Akron Fog Nozzles	03042	each	2	$ _____	$ _____
17	4 inch (100mm) Storz to 1 ½ inch (38mm)	03042	each	1	$ _____	$ _____
18	Hydrant Gate	03042	each	1	$ _____	$ _____
19	Assorted Storz keys	03042	each	7	$ _____	$ _____
20	2 1/2 inch (65mm) Keys	03042	each	3	$ _____	$ _____
21	Little Giant Ladder	03042	each	1	$ _____	$ _____
22	16 foot Roof Ladders	03042	each	2	$ _____	$ _____
23	10 foot Folding Ladder	03042	each	1	$ _____	$ _____
24	6 foot Pike Poles	03042	each	2	$ _____	$ _____
25	8 foot Pike Poles	03042	each	2	$ _____	$ _____
26	12 foot Pike Poles	03042	each	2	$ _____	$ _____

FORM B: PRICES
(See B8)

ERROR! REFERENCE SOURCE NOT FOUND.

UNIT PRICES

ITEM NO.	DESCRIPTION	SPEC. REF.	UNIT	APPROX. QUANTITY	UNIT PRICE	EXTENDED AMOUNT
27	24 foot Extension Ladder	03042	each	1	$ _____	$ _____
28	24 foot Extension Ladder	03042	each	1	$ _____	$ _____
29	Square Head Shovels	03042	each	2	$ _____	$ _____
30	Stokes Rescue Basket	03042	each	1	$ _____	$ _____
31	MSA SCBA 4500 psi (current NFPA c/w square bottles	03042	each	4	$ _____	$ _____
32	Hydraulic Spreader with connector hose	03042	each	1	$ _____	$ _____
33	Hydraulic Saw	03042	each	1	$ _____	$ _____
34	Hydraulic Cut Off Tool c/w 20 feet of hydraulic hose and manifold	03042	each	1	$ _____	$ _____
35	Hydrant Connection	03042	each	1	$ _____	$ _____

TOTAL BID PRICE (GST and MRST Extra) (in Figures)_____

(in Words)_____

_____
Name of Bidder

DETAILED SPECIFICATIONS 03042

100 FOOT RESCUE, LADDER PLATFORM FIRE TRUCK

1.0 INTENT

1.1 It is the intent of these specifications to describe a telescopic, articulating, and elevating platform with a rescue ladder and waterway system mounted on a chassis supplied by the manufacturer. The unit shall be designed for high level rescue and fire fighting. The platform shall consist of three boom sections and a fixed length articulating section with a self-leveling platform attached to the end of the boom.

1.2 The NFPA 1901 standard for Automotive Fire Apparatus Chapter 18 sections 18-7 through18-13 and sections 18-17 through 18-25 shall serve as guidelines for unit configuration.

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.

1.4 The telescopic, articulating, and elevating platform with a rescue ladder and waterway system, hereinafter referred to as the unit or the apparatus, shall be a new or a "Demo Unit" (with no more that five hundred (500) hours of operation) 2004 model as may be modified by these specifications. The apparatus including all necessary components, shall be furnished complete and ready for use by the Contractor. All parts not specifically mentioned but which are required to complete and place the apparatus into successful operation shall be furnished as though specifically mentioned in these specifications.

1.5 It will be the responsibility of the bidder to inform the City of any errors or omissions in these specifications, for under this Contract the Contractor shall be held responsible for the satisfactory operational function of the unit.

State make and model being bid. _____

2.0 OTHER SPECIFICATIONS AND STANDARDS

2.1 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 accordance with B3.1. The Bidder shall submit within (48) hours of the request of the Contract Administrator, proof of compliance with NFPA 1901 (current edition) sections 18.20 and 18.24, including the test results, certified by an independent registered Professional Engineer and satisfactory to the Contract Administrator.

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, the Manitoba Highway Traffic Act.

2.4 Within 48 hours upon the request of the Contract Administrator Bidders shall include:

a) a written statement certifying that the apparatus being bid complies with all requirements of the standards referred to in this document.

b) 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 of the European Crash Test Standards, **ECE R-29, Addendum 28, Revision 1, 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 an independent registered Professional Engineer and satisfactory to the Contract Administrator.

3.0 QUALIFICATIONS OF MANUFACTURER

3.1 The manufacturer(s) of the apparatus shall have a minimum of three (3) years continuous experience manufacturing aerial LADDER/PLATFORMS of the type being offered. The type of apparatus being offered, or one similar in nature, shall have an incident free, manufacturing history. The manufacturer shall have in effect a complete and documented quality control program ensuring compliance with all applicable standards.

Note: Bidders shall include a detailed description of the manufacturer's experience and qualifications within 48 hours upon the request of the Contract Administrator. 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 climatic 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 deviation, or give reply where requested to do so**. Deviations shall be clearly stated and fully detailed. Alternatives will be considered subject to evaluation.

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 SECTION 1- AERIAL SPECIFICATIONS

5.1 The apparatus shall be designed and built to operate on a continuous duty basis in the climatic conditions common to the City of Winnipeg 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 snow fall of approximately 42 inches. The apparatus when not in use will be stored in a heated building. _____

5.2 The elevating platform shall have a minimum vertical height 100 ft at full extension and of elevation. Measurement of the height shall be consistent with NFPA section 18-7.2, which calls for the vertical plane measurement to be taken from the top surface of the platform handrail to the ground. _____

5.3 The rated horizontal reach of the platform shall be a minimum of 88 ft. Measurement of the reach shall be consistent with NFPA section 18-7.3, which calls for the horizontal plane to be measured from the centre line of rotation to the front face of the platform. State. _____

5.4 The platform shall be capable of operating safely in any plane up to one degree out of level at full capacity. The operator is required to set up the unit within .5 degree of level front to rear and side to side. The unit

complies with the stability requirements as outlined in NFPA 1901, 18-21.1.2. _____

5.5 To provide maximum vehicle manoeuvrability, the aerial shall not overhang the front or rear of the apparatus body and cab. The aerial shall be of the rear mount design to minimize the travel size of platform. The platform shall store behind the cab as not to interfere with visibility. _____

5.6 The platform shall be capable of operating 15 ft below grade for additional rescue ability. The platform shall also articulate to provide access over parapet roofs and over roof peaks. Additionally, the platform shall have the ability to reach the ground within 10 ft of the apparatus through 360^{o} (degrees) of rotation for performance in congested streets. _____

5.7 The aerial shall be equipped with a limit system to manage the operational envelope of the aerial. The limiting system shall be self controlling. This ensures that a limit switch must be working before control of the particular function is activated. All critical safety switches must have back up switches. _____

5.8 The rated capacity of the elevating platform shall be 1,000 lbs. plus 210 pounds of equipment mounted in the platform with no water in the water delivery system. This capacity is available through the entire working area of the platform. This capacity shall meet the minimum NFPA 1901, 18-8.1 requirements. _____

5.9 The rated capacity of the platform shall be 750 lbs. plus 210 pounds of equipment with the water delivery system full of water. This capacity is available through the entire working area of the platform. This capacity shall meet the minimum NFPA 18-8.1 requirements. _____

5.9.1 The stability of the platform shall meet the requirement in NFPA 1901, 18-21.1.1 and 1901, 18-21.1.2. The weight rating of each person shall be 250 lbs. _____

5.10 In a fully loaded condition without water in the waterway, the rated wind speed shall be a minimum 40 mph. State.

5.10.1 With a 750 pound live load in the platform the rated allowable wind speed shall be increased to approximately 50 mph. State. _____

5.10.2 While flowing water, with a 750 pound live load in the platform, the maximum allowable wind speed shall be approximately 30 mph. State. _____

5.11 The platform shall be designed with a minimum 2 to 1 structural safety factor. This safety factor shall apply to all aerial components including torque box, turntable and outrigger components. Definition of the platform structural safety factor shall be as defined in NFPA 1901 A-18-20.1. _____

The safety factor shall be computed as follows:

DL = Dead Load stress. Stress produced by the aerial device and all components

RL = Rated Load stress. Stress produced by the rated capacity of the aerial device

WL = Water Load stress. Stress produced by nozzle reaction and water in the delivery system.

FY = Material yield strength. The stress at which a material exhibits a specified permanent distortion or set without waterflow:

2 x DL + 2 x RL is less than or equal to FY with waterflow:

2 x DL + 2 x RL + WL is less than or equal to FY

5.11.1 A factor of safety shall also be applied to the stability of the elevated platform. The stability factor shall be as defined in NFPA 1901 18-21.1.1, which requires a 1.5 to 1 margin in every possible aerial position on level ground in which the apparatus can be placed.

6.0 MANUFACTURING REQUIREMENTS:

6.1 The aerial boom shall be manufactured under the ISO 9001 quality system. All welding of aerial components including torque box, turntable, jack mounting assemblies and boom sections shall be performed by welders that are certified to American Welding Society Standards D1.1, D1.2, and D1.3 or CSA Standards W47.1 and W47.2.

6.2 To insure maximum quality of boom weldments, An ASNT or CGSB Certified Level II Non-Destructive Test Technician shall examine the weldment assemblies visually and test mechanically. Testing procedures shall conform to either CGSB Standards or the American Welding Society Standard B1.10, guides for non-destructive testing. Test methods may include dye penatrant, ultrasound, and magnetic particle where applicable.

6.2.1 Detailed report shall be supplied on delivery.

7.0 HYDRAULIC SYSTEM:

7.1 The hydraulic system shall be of the latest design and incorporate features to minimize heat build up and provide smooth control of the aerial platform. The system shall meet the performance requirement in NFPA 1901, 18-19.6, which requires adequate cooling for a minimum of 2 1/2 hours of operations. No auxiliary cooling systems shall be required.

7.2 All hydraulic components that are non-sealing whose failure could result in the movement of the platform shall comply with NFPA 1901, 18-19.1 and have burst strength of 4 to 1. Dynamic sealing components whose failure could cause platform movement shall have a margin of 2 to 1 on maximum operating pressure per NFPA 1901, 18-19.1.1. All hydraulic hoses, tubes and connections shall have minimum burst strength of 3 to 1 per NFPA 1901, 18-19.2. A Hydraulic oil pressure gauge shall be supplied at the base control location.

7.3 Hydraulic power for all operations shall be supplied from a power take off, located on the transmission. The pump shall be a double, load sensing, variable displacement hydraulic pump. A variable displacement pump is desired to minimize system heat build up. The pump shall be able to supply 50 gallons per minute at a maximum pressure of 3000 psi. The system shall incorporate a relief valve to prevent over pressurization. Normal operating pressure shall be 2800 psi.

7.4 The hydraulic system shall consist of a 80 gallon reservoir integral to the

torque box and plumbed to the hydraulic pump. The tank shall be supplied with a removable top to access tank strainer filter. There shall be plumbing for a supply and return line and a tank drain on the reservoir. The reservoir cap shall be marked per NFPA 1901, 18-19.5 and be equipped with a 10 micron breather filter to clean incoming air to the reservoir. Gated valves under the tank shall facilitate filter changes. _____

7.5 The aerial shall utilize aircraft style servo hydraulic controls with manual overrides on the servo valve should a control system failure occur. _____

7.6 The Hydraulic system shall incorporate the following filters;

Reservoir breather	10 micron	_____
Reservoir strainer	125 mesh (magnetic)	_____
Pressure filter (torque box)	10 micron	_____
Turntable pressure filters	10 micron (2)	_____
Boom knuckle	10 micron	
Return filter	10 micron	_____

7.6.1 All pressure filters shall be equipped with restriction indicators. There shall be no hoses between a filter and servo control valve to insure maximum oil cleanliness. The quality of pressure filters shall be beta 75 or better. _____

7.7 The aerial hydraulic system shall be designed in such a manner that a hydraulic pump failure or line rupture shall not allow the aerial or outriggers to lose position. Hydraulic holding valves shall be mounted directly on cylinders. To insure reliable performance of holding valves, no hoses shall be permitted between a holding valve and cylinder. _____

8.0 TORQUE BOX

8.1 The bolt on the torque box assembly shall be constructed of high tensile steel and designed to transfer all stress of the aerial operation to the four outriggers to prevent damage to the truck chassis frame and the body. The stabilizer sleeves shall be integral to the torque box. The inside of the torque box shall be reinforced for strength. _____

8.2 The torque box shall be designed to incorporate an integral hydraulic reservoir to maximize body compartment space. _____

9.0 OUTRIGGERS

9.1 The unit shall be equipped with two sets of extendible out and down “H” style outriggers. _____

9.2 The outriggers shall be constructed of high tensile steel. _____

9.3 The cylinders shall incorporate dual pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working position should a charged line be severed at any point in the hydraulic system. _____

9.4 The outriggers shall level side to side and front to rear on uneven surfaces such as curbs and road crowns. _____

9.5 The outrigger cylinders shall be sized to maximize ground penetration. Each outrigger shall have a spherical outrigger pad attached to the cylinder end. The spherical end shall permit levelling on uneven surfaces and require no adjustment during the set up process. _____

9.6 The outrigger ground contact area for each stabilizer shall not exceed 75 psi when the apparatus is fully loaded and the aerial device is carrying its rated capacity in every position. This shall be accomplished with the stabilizer pads deployed, as outlined in NFPA 1901, 8-21.2.3. _____

10.0 AUTOMATIC OUTRIGGERS

10.1 A microprocessor based outrigger control and levelling system shall be supplied to reduce set up time at emergency scenes. _____

10.2 The system shall consist of a control box with a minimum 15 foot, coiled cord and central panel installed on the rear body. _____

10.3 The control system shall allow the operator to deploy the outriggers and level the apparatus in less than 30 seconds. State time. _____

10.4 The central panel shall indicate level condition, power to system, out of level and firm outrigger placement. The system shall operate from the control box. _____

10.5 The control box shall have three buttons and one toggle switch. The buttons shall deploy left outriggers, right outriggers and level control. The toggle switch shall select between deployment and storing functions. _____

10.6 The outrigger control system shall enhance outrigger set-up but not be required for outrigger operations. The manual controls shall be the secondary system. _____

11.0 MANUAL OUTRIGGER CONTROLS

11.1 Eight (8) hydraulic levers shall control the outriggers. The control levers shall be located at the rear of the apparatus. _____

11.2 Outrigger deployment shall be completed in less than 90 seconds. State. _____

11.3 Two (2) colour-coded level indicators shall be supplied at the rear of the apparatus. The gauges shall have green and red zones. The green indicates optimal performance. The red zone indicates the vehicle is outside the safe operating condition with full rated loads. _____

11.4 The aerial shall be capable of full rated capacity in any plane up to $1/2^{o}$ (degrees) out of level. _____

11.5 The hydraulic system shall be designed to prevent platform movement until the outriggers are set. Additionally, the system shall not permit outrigger movement when the aerial is out of the cradle. This requirement is outlined in NFPA 1901, 18-17.4. _____

12.0 TURNTABLE SUPPORT ASSEMBLY

12.1 The structural design of the turntable support assembly shall be an integral part of the torque box. A rigid cylindrical steel construction shall be supplied at the rear of the torque box for mounting of the aerial device. _____

12.2 A service access hole shall be supplied in the lower portion the cylinder for access to hydraulic and water supply lines. _____

12.3 A bearing mounting plate shall be welded to the top of the cylindrical turntable support. A circular bearing mounting plate shall be drilled and machined to accept a rotation bearing. _____

12.4 The bearing shall permit 360^0 (degrees) of continuous rotation. _____

13.0 UPPER TURNTABLE ASSEMBLY

13.1 The upper turntable assembly shall bolt to the rotation bearing and provide for mounting of the elevating platform, lift cylinders, rotation motor and turntable control station. _____

13.2 The upper turntable assembly shall be completely constructed of high tensile steel. State material grade. _____

13.4 The upper turntable assembly shall incorporate a structure that the boom shall be secured to. The pivot point for the boom shall provide no additional vehicle overhang from elevation of the aerial. _____

13.5 The area behind and on the sides of the assembly shall be free of hydraulic components. _____

13.6 The hydraulic rotation drive, lift cylinders, servo control valves and hydraulic connections shall be located between the dual lift cylinders. _____

14.0 ROTATION MECHANISM

14.1 Rotation shall be accomplished with a high torque hydraulic motor. _____

14.2 The hydraulic motor shall be driven through a spring applied hydraulically released multiple disk brake into a planetary gearbox. _____

14.3 The output shaft shall be splined and shall mate with a spur gear, which shall drive the main ring gear on the turntable bearing. _____

14.4 Rotation control shall be provided by high quality aircraft grade servo hydraulic control valve with a manual back up. _____

14.5 A manual rotation system shall be supplied on the rotation drive. _____

14.6 Tools required to operate manual rotation shall be supplied with the unit. _____

14.7 A cradle alignment indicator light shall be supplied at the base and tip control stations for storing the elevating platform. _____

15.0 HYDRAULIC, ELECTRIC AND WATER SWIVEL

15.1 Transfer of hydraulic, electric and water from the chassis to the aerial shall be accomplished through a swivel housing under the turntable permitting 360^{o} (degrees) of continuous rotation. _____

15.2 The swivel shall have four hydraulic ports for oil supply. _____

15.3 Electric power shall be transmitted to the turntable by way of collector rings that are enclosed inside of the swivel. The contacts shall be dual contact for added reliability. _____

15.4 Water shall pass through a 4inch opening in the centre of the swivel. _____

16.0 PLATFORM ELEVATION MECHANISM

16.1 The main boom section shall be elevated by dual, double action, hydraulic cylinders. _____

16.2 This system shall allow boom angles from 0^{o} (degrees) horizontal to 84^{o} (degrees) above horizontal. _____

16.3 The cylinders shall mount to the upper turntable assembly and connect to the base of the boom through two bearings. _____

16.4 The cylinders shall have automatic cushions at the end of the stroke. _____

16.5 The cylinders shall be fitted with integral holding valves to prevent unintentional movement of the boom should a hydraulic line rupture or the system pump fails. _____

16.6 The platform elevation cylinders shall be fitted with manual bleed down controls at the turntable and platform control stations. _____

16.7 The elevation servo control valve shall be fitted with manual control to raise and lower the boom. The elevation system shall be equipped with a full elevation retarder system that shall sense the boom nearing full elevation and reduce operating speed to provide a smooth stop. _____

17.0 TURNTABLE CONTROL STATION

17.1 The aerial shall have two control stations. One shall be referred to as the turntable station and one as the platform control station. _____

17.2 The turntable shall serve as the master station with the ability to override the platform controls. The turntable control station shall be mounted on the left side of the boom. _____

17.3 It shall be fitted with a roll over console cover to protect the controls from weather and damage while in transit. _____

17.4 The following controls shall be supplied under the console;

1) control power switch (tip, base, off) _____
2) manual platform levelling _____
3) manual bleed down system (requires bleeding extension first then elevation) _____

17.5 The following controls shall be supplied on the upper flat and vertical control panel;

1) two (2) panel lights
2) outrigger position indicator lights
3) PTO start and stop button
4) Emergency stop button
5) Cab protection indicator and cradle alignment light with override
6) Platform swivel control switch
7) Platform alignment indicator
8) 12volt emergency backup hydraulic pump control
9) Signal horn button
10) Platform overload indicator
11) Rescue ladder rung alignment indicator
12) Elevation, Rotation, Extension and Jib boom control levers
13) Main hydraulic system pressure gauge

18.0 BOOM CONSTRUCTION

18.1 The boom shall be comprised of four sections. The first section shall be fixed to the turntable assembly. Two telescopic sections shall be nested within the base. The fourth boom section shall be of fixed length and articulate from a knuckle at the end of the last telescopic section.

18.2 The articulating boom shall be referred to as the jib boom. The jib boom shall articulate approximately 180^{o} (degrees) and have a self levelling platform attached to the end.

18.3 All boom sections shall be rectangular solid wall fabricated from high strength low alloy steel. The yield strength of the material shall be as recommended by the manufacturer certified by the steel maker.

18.4 A closed boom design is preferred to maximize torsional rigidity and strength to weight ratio.

18.5 The total storage length of the boom sections in the travel position shall be less than 36 feet.

18.6 A vehicle with no front or rear overhang is desired to improve road visibility and reduce unit overall length.

18.7 The boom sections shall incorporate service access panels to allow for access to wiring, hydraulics and the chain extension system.

19.0 FIRST BOOM LIFTING EYE

19.1 A lifting eye shall be provided at the tip of the base boom. The lifting eye shall allow for a load of 2200 pounds to be lifted using customer supplied rigging.

20.0 BOOM PAINTING

20.1 Prior to any boom assembly, the sections shall be painted to protect the booms from corrosion. The booms shall be painted with a paint process recommended by the manufacturer to provide maximum protection from the elements.

20.2 Cleaning, material preparation and colour scheme of the boom sections shall be as recommended by the manufacturer.

20.3 All other aerial components including turntable, cylinders, control console, and platform shall be painted the same colour. _____

21.0 EXTENSION/RETRACTION SYSTEM

21.1 The elevating platform shall utilize a hydraulically powered extension and retraction system for the main boom, boom two and boom three. _____

21.2 The design of the extension and retraction system shall be as recommended by the manufacturer. _____

21.3 The hydraulic system shall be fitted with integral load holding valves to prevent movement of the boom should a hydraulic line be cut or a hydraulic system failure should occur. _____

21.4 The extension and retraction system shall be fully enclosed within the boom assembly to avoid exposure to the elements. _____

21.5 All hydraulic and electrical connections shall be easily accessible. _____

21.6 All other extension and retraction components shall be easily accessible. _____

21.7 This system shall comply with the requirement as outlined in NFPA 1901, 18-20.3. _____

21.8 A safety interlock system shall be provided to monitor the extension . State particulars.

_____

_____

_____

_____

21.8.1 The safety interlock system shall disable the aerial controls in the event the aerial is proceeding outside of safe operating range. _____

21.9 The extension and retraction system for platform electrical, hydraulic and control wires shall be mounted in a track roller system inside the booms. The track system shall be resistant to the elements and provide easy service access to harness assembly. For reliability, systems which utilize spring loaded cable reels for tip power shall be unacceptable. _____

22.0 BOOM SLIDE MECHANISM

22.1 Pads at top, bottom and side to provide a low maintenance slide system, the boom shall incorporate slide pads. These slide pads shall not require lubrication. This will eliminate the need to clean and lubricate the aerial slide pads. _____

23.0 JIB BOOM ARTICULATION SYSTEM

23.1 The jib boom shall have one double acting cylinder and shall travel through approximately 180^{o} (degrees) of vertical movement. The cylinder ends shall be designed as to eliminate transfer of moment loads to the cylinder or rod. _____

24.0 RESCUE LADDER

24.1 A fully NFPA compliant climbing ladder shall be provided on the right side of the telescopic boom assembly and shall be accessible from the platform and right side of the turntable _____

24.2 The ladder shall have four (4) aluminum sections corresponding to each boom section. _____

24.3 The fly section of the rescue ladder shall be equipped with fold up handrails to facilitate compact storage. _____

24.4 The handrails shall be capable of deployment from the platform or the top of the third boom section. _____

24.5 The aerial shall be fitted with an interlock system that prevents storage of the aerial with the handrails deployed. _____

24.6 There shall be a rung alignment indicator located at the platform and turntable control console locations. _____

24.7 The ladder shall be capable of supporting two people in every second section for a maximum load of seven (7) people with one in the platform. A graphical illustration shall be supplied in the platform to indicate capacity. _____

25.0 WATERWAY SYSTEM

25.1 The elevated platform shall be supplied with a water delivery system for high level fire fighting as outlined in NFPA 1901, 18-12. _____

25.2 The water delivery system shall be fed from a 4inch stainless steel waterway inlet below the turntable assembly and through the centre of the hydraulic, electric and water swivel. _____

25.3 The waterway shall not incorporate any double swivels from the base boom to the platform. Flexible connections shall be employed at the turntable, first boom knuckle, and at the rear of the platform. _____

25.4 Each of the telescopic waterway pipe sections shall be chrome plated stainless steel . _____

25.5 The waterway telescopic sections shall be fitted with adjustable packing gland seals on the sliding surfaces. _____

25.6 Each fitting shall be equipped with grease zerks to lubricate the waterway tubes. _____

25.6.1 The fittings shall be equipped to handle water back pressure and prevent water leaks. _____

25.7 The permanently installed monitor on the platform shall be capable of discharging 1000 gpm at 100 psi nozzle pressure with the elevating platform at rated vertical height. Friction loss (total system loss less head loss) between the monitor and a point below the waterway swivel shall not exceed 100 psi as outlined in NFPA 1901, 18-12.1. _____

26.0 PLATFORM CONSTRUCTION

26.1 Attached to the end of the jib boom shall be a fire fighting platform for transporting firefighters, elevated master stream and rescue operations. _____

26.2 The platform shall be constructed of high strength steel. The platform shall be designed to provide maximum working area of approximately 20 square feet. State size. _____

26.3 The platform shall provide a structure with a continuous handrail around the perimeter. _____

26.4 The platform shall be 42 inches high from the floor of the structure to the top handrail. _____

26.5 The platform shall have three (3) entrance/exit locations. An opening approximately 25 inches wide shall be supplied on the front of the platform. _____

26.6 A second opening next to the control console on the left side of the platform shall be supplied. _____

26.7 A third opening with folding step shall be supplied in the right rear of the platform for access to the rescue ladder. _____

26.8 All platform doors shall have positive latches and swing inward. _____

26.9 The platform shall be supplied with a minimum of two safety belt attachment points located at the rear centre of the platform. _____

26.10 The water monitor shall be an Akron Sabre Master, Part # 1577 and shall be located at the right front corner of the platform. _____

26.11 Side heat shields and an integral floor/heat shield shall be provided for the platform. The side heat shields shall be constructed of aluminum or as recommended by the manufacturer. State. _____

26.12 A fixed rescue platform approximately 60 inches wide and 15 inches deep shall be supplied on the front face of the platform to improve rescue access. _____

26.13 The floor of the front rescue platform shall be constructed of grip strut material. _____

26.14 The platform shall support a minimum of 400 lbs. The platform load shall be deducted from total load capacity. _____

27.0 PLATFORM LEVELLING SYSTEM

27.1 A platform levelling system shall be provided and so designed that the platform, with it's rated payload can be supported and maintained level relative to earth, regardless of elevation or position of the aerial device. _____

27.2 The levelling of the platform shall feature an electro-hydraulic cylinder in the jib boom, controlled by a levelling sensor in the platform. The system shall a minimum combined safety margin of 14 to 1. _____

27.3 The platform shall be equipped with a manual level control system should the main system fail. _____

27.4 A safety interlock shall be supplied that disables the levelling system if the platform is more than 10^{o} (degrees) out of level. _____

27.5 If the platform is more than 14^{o} (degrees) out of level, the aerial hydraulic pump shall automatically be shut down. _____

28.0 PLATFORM ROTATION SYSTEM

28.1 The platform shall rotate 45^{o} (degrees) to either side of centreline. Rotation shall be achieved through a pivot point at the rear of the platform and controlled by single hydraulic cylinder mounted behind the platform. _____

28.2 Controls shall be supplied at the turntable and platform control stations. A safety system shall be supplied to prevent aerial movement if the articulated basket is in a possible conflict with other aerial components. _____

28.3 A green light shall be supplied at both control locations to indicate platform alignment to centreline. _____

29.0 PLATFORM CONTROL CONSOLE

29.1 The platform control station shall be mounted at the left front corner of the platform. _____

29.2 The console shall be supplied with cover to protect the controls and not impair vision. _____

29.3 The control panel shall have three faces. A lower face below the console shall be fitted with the following:

1) Platform control power _____
2) Manual levelling for the platform _____
3) Manual bleed down for the extension and elevation system _____

29.4 The upper control panels shall be fitted with the following:

1) Control panel lighting that activates with control power _____
2) Outrigger ground contact lights _____
3) PTO start/stop and Emergency stop buttons _____
4) Position for water flowmeter _____
5) Signal horn _____
6) Platform overload light/alarm _____
7) Rung alignment indicator _____
8) Emergency 12volt pump system switch _____
9) Platform rotation control with indicator light _____
10) Cradle alignment light and override switch _____
11) Operating levers for extension, retraction, elevation, boom elevation. _____

29.5 The platform shall be supplied with two shower curtains for protection from heat. _____

29.6 The shower curtains shall be controlled by a single push/pull lever at the front of the platform. _____

30.0 HYDRAULIC TOOL OUTLETS IN PLATFORM

30.1 Hydraulic tool outlets shall be mounted in the platform for the installation of portable hydraulic accessories. _____

30.2 Hydraulic power for the outlets will be provided by the aerial hydraulic system and will provide power whenever the aerial hydraulic system is engaged. The system will provide a working pressure of 2600 PSI (180 Bars). _____

31.0 PUMP MODULE

31.1 The apparatus body shall be divided into two (2) individual sections. The pump compartment shall be a separate module from the apparatus body and hosebed compartment. _____

31.2 The pump shall be a midship mounted Waterous CS100 (2000gpm) or equivalent, single stage, centrifugal pump. The pump shall be mounted on the chassis frame rails and shall be split drive driven. _____

31.3 All metal moving parts in contact with water shall be of high quality bronze or stainless steel. _____

31.4 The pump impeller shall be hard, fine grain bronze and shall be ground and hand balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body. _____

31.5 The pump shaft shall be ground, heat treated chrome nickel steel, and shall be rigidly supported by three bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox. _____

31.6 Two (2), 6 inch diameter suction ports with 6 inch NST male threads and removable screens shall be provided, one each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps. _____

32.0 DISCHARGE MANIFOLD

32.1 The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to all discharge valves. The manifold and fabricated piping systems shall be constructed of stainless steel. _____

33.0 PRIMING SYSTEM

33.1 The electrically driven priming pump shall be a positive displacement vane type. _____

33.2 One (1) priming control shall be located at the pump operator's position. The control shall open the priming valve and start the priming motor. _____

33.3 The primer shall be oil-less type. The priming valve shall be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear. _____

34.0 PUMP SHIFT

34.1 The pump shift shall be pneumatically controlled using a power shifting cylinder. _____

34.2 The power shift control valve shall be mounted in the cab, and be labelled "PUMP SHIFT". The apparatus transmission shift control shall be furnished with a positive lever to prevent accidental shifting of the chassis transmission. _____

34.3 A green indicator light shall be located in the cab, and be labelled "PUMP ENGAGED". The light shall not activate until the pump shift has completed its full travel into pump engagement position. _____

34.4 A second green indicator light shall be located in the cab and be labelled "OK TO PUMP". This light shall engage when both the pump shift has been completed and the chassis automatic transmission has obtained converter lockup (4^{th} gear lockup). _____

34.5 One (1) pump panel mounted "GREEN" indicator light shall be positioned above the throttle control on the pump operator's panel. The light shall be energized when the pump shift has been completed, chassis automatic transmission has obtained converter lockup (4^{th} gear lockup), and the chassis parking brake is set. _____

35.0 SYSTEM

35.1 One (1) 4-1/2 inch master suction and one (1), 4-1/2 inch master discharge gauge shall be pump panel mounted. These compound gauges shall be liquid filled. _____

35.2 Two (2), test plugs shall be pump panel mounted for third party testing of vacuum and pressures of the pump. _____

35.3 A master drain valve shall be installed and operated from the pump operator's panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal and turning handle. _____

35.4 The manual master drain valve shall be constructed of corrosion resistant material and be capable of operating at a pressure of up to 600 psi. _____

35.5 The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices, discharges & suction inlets. _____

36.0 PUMP PANEL DISCHARGES/PRE-CONNECTS

36.1 Two (2), 1 1/2 inch lines cross mounted. _____

36.2 One (1), 2 1/2 inch hose. _____

36.3 Two (2), 4 inch outlets. _____

36.4 One (1), 2 1/2 inch discharge outlet with a manually operated Akron valve shall be provided at the left side pump panel. _____

36.5 One (1), 2 1/2 inch discharge outlet with a manually operated Akron valve shall be provided at the right side pump panel. _____

36.6 The valves shall be an Akron 8800HD series with a chrome plated brass ball for ease of operation and increased abrasion resistance. The valve shall have a self locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position and water is flowing through it. _____

36.7 The valve shall be the Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. _____

36.8 The discharge shall include a Class 1, 2 1/2 inch diameter liquid filled (-30-0-600) psi pressure gauge mounted at the pump panel adjacent to the discharge control. _____

36.9 The discharge shall be supplied with a 3/4 inch bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel. _____

36.10 The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times. _____

36.11 All fabricated piping shall be high grade stainless steel. State grade. _____

37.0 BOOSTER TANK

37.1 The booster tank shall have a capacity of 300 gallons. All tank sides, top and bottom, shall be constructed of 1/2 inch black UV stabilized copolymer polypropylene. _____

37.2 The tank shall be constructed utilizing latest thermo plastic welding technology. The tank shall be tested for the following prior to installation in the truck:

1) The process shall include an electronic spark test to test for imperfections in the welds

2) A waterfill test.

37.3 The tank shall have a combination vent and manual fill tower. The tower shall be located in the left front corner of the tank.

37.4 The tank overflow shall be 4 inch diameter. The tower shall have a hinged cover and screen.

37.5 There shall be two (2) standard tank openings; one for the tank to pump suction line with an anti-swirl plate and one for a tank fill line.

37.6 Interlocking horizontal and vertical baffles shall be incorporated into the tank and thermo welded to minimize water movement during travel. Baffle configuration and placement as recommended by the manufacturer.

37.7 Openings in the baffles shall be positioned to allow water flow to NFPA standards during filling or pumping operations.

37.8 The tank shall be mounted on hard rubber cushions to isolate the tank from road shock and vibration.

37.9 The tank shall be completely removable without disturbing or dismounting the apparatus body structure.

38.0 TANK PLUMBING AND GUAGES

38.1 The tank fill line shall be 1 1/2 inch, c/w 2 inch valve.

38.2 The tank to pump line shall be 3 inch.

38.3 All valves shall be Akron electric actuated with 9303 controller.

38.4 All discharges shall be provided with 2 1/2 inch dual scale winterized pressure gauges.

38.5 Weatherproof 2 1/2 inch dual scale (kpa/psi) compound vacuum pressure gauge with a range of 30-0-600 PSI/100-0-4140 KPA shall be installed on the pump panel. The gauge shall be filled with a liquid solution. One (1) gauge shall be provided for each discharge.

38.6 Two (2) Akron, liquid filled, weatherproof 4 1/2 inch dual scale (kpa/psi) compound vacuum pressure gauges with a range of 30-0-600 PSI/100-0-4140 KPA shall be installed on the pump panel.

38.7 All electric valve actuators to be positioned so that manual overrides can be accessed through a hole in pump or body panel.

38.8 All fabricated piping shall be stainless steel for superior corrosion resistance, and decreased friction loss.

39.0 APPARATUS BODY

39.1 The apparatus body shall be constructed entirely of modular, aluminum extrusions with interlocking aluminum plates.

39.2 The body mainframe shall be entirely constructed of aluminum. The complete framework shall be constructed of aluminum alloy extrusions welded together. Aluminum grade as recommended by manufacturer for high corrosion resistance. State grade. _____

39.3 The mainframe shall incorporate a series of vertical frame components connected in series.The open centre shall permit the installation of a tunnel for ground ladder storage. _____

40.0 BODY SIDE ASSEMBLIES

40.1 The left and right side body assemblies shall be framed with aluminum wall extrusions. The front and rear body corners of the side assemblies shall be radiused, corner extrusions. The body compartments shall be framed to make full height compartments ahead and behind the wheel well opening. The body side assemblies shall be designed so that the compartment walls are not required to support the body. The compartments shall be interlocked and welded to the side assembly extrusions. _____

40.2 The top of the body side assemblies shall be supplied with tread plate covers with polished corners and shall provide service access to electrical components. _____

41.0 WHEEL WELL OPENING/LINERS

42.1 The wheel well frame shall be constructed from aluminum extrusions. _____

42.2 The wheel well liners shall be smooth plate aluminum painted body colour. The inner liners shall be welded continuous to the body side frame. _____

43.0 STABILIZER OPENINGS

43.0 The body shall be designed to accommodate a four leg stabilizer aerial system. One opening shall be supplied behind the rear axle as close to the wheel well opening as possible to maximize rear angle of departure and to prevent the stabilizer pads from contacting the ground during driving. _____

43.2 The second set shall be mounted in a location recommended by the equipment manufacturer. State location.

43.3 The openings shall be framed in aluminum extrusions. A stabilizer cover made from tread plate shall be supplied on the extendable stabilizer. The cover shall provide a mounting location for a red stabilizer warning light as outlined in NFPA 1901 18-21.2.5. _____

43.4 The stabilizer openings shall be supplied with clear lights to illuminate the stabilizers and the ground surrounding the openings. The lights shall automatically illuminate when any stabilizer is moved from the stored position. _____

44.0 HANDRAILS

44.1 Access handrails shall be provided at all step positions, including, but not limited to, the rear tailboard and installed to NFPA 1901 13-8. All body handrails shall be constructed of maintenance free, corrosion resistant, extruded aluminum. _____

44.2 Handrails shall be manufactured as recommended by the manufacturer and shall be installed between chrome end stanchions at least 2inches away from the mounting surface to allow for access with a gloved hand. The extruded aluminum shall be ribbed to assure a good grip for personnel safety. _____

45.0 STEPS, STANDING AND WALKING SURFACES

45.1 The maximum stepping distance shall not exceed 18 inches, not to include ground to first step. The ground to first step shall not exceed 24 inch. The ground to first step shall be maintained when the stabilizers are deployed by an auxiliary set of steps installed at the aerial access staircase. All steps or ladders shall sustain a minimum static load of 500 pounds without deformation as outlined in NFPA 1901,13-7.2. _____

45.2 All exterior steps shall be designed with an average slip resistance of .68 when wet as measured with a English XL tester following ASTM F 1679(Standard Test Method for Using a Variable Incidence Tribometer). _____

46.0 APPARATUS WARNING LABELS

46.1 A label shall be supplied on the rear body to warn personnel that riding in or on the rear step is prohibited as outlined in NFPA 1901 13-7.4. _____

46.2 A label shall be applied to both sides of the apparatus and the rear to warn operators that the aerial is not insulated. _____

47.0 RUBRAIL

47.1 The body shall have a rubrail along the length of the body on each side and at the rear. The rubrail shall be constructed of minimum 3/16 inch thick anodized aluminum extrusion. The grade of aluminum, size and design of the rubrail will be as recommended by the manufacturer and shall extend beyond the body width to protect compartment doors and the body side. _____

47.2 The rubrail shall be of a C-channel design to allow marker and warning lights to be recessed inside for protection. The top surface of the rubrail shall have a slip resistant edge for the rear step and running boards. _____

47.3 The rubrail shall be spaced away from the body using nylon spacers. _____

47.4 The rubrail ends of each section shall be provided with a rounded corner piece. The area inside the rubrail C-channel shall be inset with a white reflective material for increased side and rear visibility. _____

48.0 PUMP COMPARTMENT

48.1 The pump operator's control panel and pump compartment shall be located at the front of the body. The operator's controls and gauges shall be located on the left side (street side) of the apparatus. The compartment shall be designed following NFPA 1901 13.6. _____

48.2 The left and right side pump panels shall be completely removable for easy access to the pump compartment. Each panel shall be split approximately two-thirds of the way from the bottom by an anodized extrusion, which shall allow removal of the left side upper panel for easy access to gauges. _____

48.3 An aluminum diamond plate pump compartment access door shall be provided above the right side pump panel. The access door shall be horizontally hinged and shall be securely attached with a full-length stainless steel piano hinge and stainless steel D-ring style handle. The access door shall be as wide and high as possible. _____

48.4 A 4inch circular single bulb pump compartment light mounted in a shock resistant housing shall be supplied to inspect plumbing components. The light shall switch on with the pump panel lights.

48.5 Side running boards formed from aluminum diamond plate, shall be provided on each side of the apparatus and shall extend the full length of the pump module The running board shall be bolted to the pump compartment to provide easy removal for replacement in the case of damage.

49.0 PUMP OPERATOR'S PANEL

49.1 The pump compartment side panels shall be constructed of brushed, non-glare stainless steel. Removable panels around the side discharges shall enhance service access to main pump body discharge valves.

49.2 Pump panel light assemblies shall be provided for each side panel. The pump panel lights shall provide adequate light intensity to the pump panel as outlined in NFPA 1901 14-9.2.

49.3 Light shields shall be anodized aluminum extrusions bolted to the side pump panels.

49.4 The following instruments shall be supplied as a group on the operator's panel as outlined in NFPA 1901 14-12.1 and located as far as practical from hose connections.

- Pump Master Intake
- Pump Master Discharge
- Tachometer
- Engine Coolant Temperature Indicator
- Engine Oil Pressure
- Voltmeter
- Pressure Control(s)
- Engine Throttle
- Pump Primer
- Water Tank to Pump Control
- Water Tank Fill Valve
- Water Tank Level

49.5 Test connections for pump gauges shall be supplied on the operators panel as outlined in NFPA 1901 14-12.5. Two (2), 1/4 inch standard pipe thread connections shall be supplied with plugs and identified as intake and discharge ports.

49.6 Gauges supplied on the pump operators panel shall be compliant with NFPA 1901 14-12.2.1.1. There shall be a 1inch differential in viewing area between analog master gauges and individual analog outlet gauges. All gauges shall meet ASME B40.1 and be resistant to vibration, pressure pulsation dampened, corrosion resistant, shock resistant and condensation resistant.

49.7 Any discharge outlet 1 1/2 inch or larger shall have an output indicator and be labeled to identify its control function as outlined in NFPA 1901 14-12.3.

49.8 The valve control levers shall be chrome push-pull locking "T" handles located at the pump operator's panel unless the discharge is located on the operators panel.

49.9 Swing style valve controls shall be used if the valve is located on the operator's panel.

49.10 The control levers shall be located directly adjacent to one another and shall be mounted in line so they are in the same position when shut off. Each valve control lever shall be connected directly to its respective valve by a non-corrosive rod to form

a direct linkage control system.

49.11 The specified discharge gauges shall be located directly above the discharge control levers when possible. Each control shall be clearly marked by metal nameplates recessed into the control lever handle.

49.12 In accordance with current NFPA 1901 A-14-9.1 standards, color-coded tags shall be provided to improve identification of discharges and intakes,. Tags shall be affixed using an industrial grade adhesive backing. Pop rivets or screws used to secure tags to panels or control handles is unacceptable.

50.0 CROSSLAY COVER

50.1 A crosslay cover constructed of heavy duty nylon reinforced fire retardant vinyl shall be installed on the apparatus crosslay. Cover shall be held in place by chrome snaps with one chrome twist lock on each corner of the crosslay.

51.0 HOSEBED COVER

51.1 A hose bed cover constructed of heavy duty nylon reinforced fire retardant vinyl shall be installed over the apparatus hose bed. The cover shall be held in place by chrome snaps with one chrome twist lock on each corner of the hose bed.

51.2 The end of the hose bed cover shall be weighted to cover the hose bed opening.

52.0 ADJUSTABLE SHELVING TRACKS

52.1 All large compartment(s) shall be equipped with vertically mounted tracks for the installation of adjustable shelves and/or adjustable roll-out trays and/or vertical pull out trays

52.2 The tracks shall be of extruded aluminum and attached to the side or back wall(s).

53.0 ALUMINUM SHELVES

53.1 The shelves shall be constructed of smooth aluminum plate.

53.2 The shelves shall be of one piece construction. Each shelf shall be designed structurally to hold a maximum load of 250 pounds.

53.3 Shelving mounted to adjustable tracks mounted to the back wall shall be capable of supporting 100 pounds.

53.4 Lips are preferred on the front and the back of the shelving and shall accommodate a plastic interlocking compartment tile system.

54.0 ROLL-UP DOORS

54.1 All specified compartment(s) shall be provided with roll up doors Robinson brand (or equivalent). State.

54.2 The Robinson brand (or equivalent) door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking joints with an inner seal to prevent any metal to metal contact and be resistant to moisture and dust penetration.

54.3 The track shall be anodized aluminum. The track shall have a replaceable side seal to prevent water and dust from entering the compartment. _____

54.4 The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device. _____

54.5 A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation. _____

54.6 Each specified roll-up door and vertical side trim shall have a painted finish. The paint colour shall match the primary colour of the vehicle as specified.

55.0 "GATOR GRIP" STEP SURFACES

55.1 All body exterior step surfaces shall be provided with an aggressive skid resistant surface in accordance with current NFPA requirements. _____

55.2 Aluminum diamond plate steps shall include a multi-directional, aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8 inch (0.125 inch). _____

55.3 Gripping surfaces shall be circular in design, a minimum of 1inch diameter and on centres not to exceed 4 inches. _____

56.0 PUMP COMPARTMENT HEATERS/HEAT PANS

56.1 Two 25,000 BTU heaters shall be installed in the pump compartment and connected to the engine coolant system. The heaters shall be controlled at the left side pump panel. _____

56.2 The heaters shall have a 12V blower. _____

56.3 The pump heat pan shall be constructed of smooth aluminum plate and reinforced with aluminum extrusions. The heat pan shall be installed under the apparatus pump and securely attached to the underside of the apparatus body. The heat pan shall be easily removable for fair weather operation. _____

57.0 PUMP PANEL SLIDE-OUT PLATFORM

57.1 The slide-out platform shall be 21 inches deep and shall be constructed of Tread Brite aluminum. _____

57.2 The platform shall be mounted under the apparatus body below the pump panel. The platform shall utilize a maintenance free slide system. _____

57.3 Notches shall be provided at each end of the slots to hold the platform in both the extended and retracted positions. _____

58.0 PUMP/ PUMP CERTIFICATION (2000 gpm)

58.1 The fire apparatus shall be tested at the manufacturer's plant and certified by an independent testing agency to meet the requirements of ULC standard S515-M88. A pump performance label shall be attached to the pump panel prior to delivery of the apparatus. _____

58.2 The pump shall deliver the percentage of rated capacities at pressures indicated below:

-100% of rated capacity at 165 psi net pump pressure _____

- 70% of rated capacity at 200 psi net pump pressure _____

- 50% of rated capacity at 250 psi net pump pressure _____

58.3 A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine. _____

58.4 A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer's Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer. _____

59.0 ELECTRONIC FIRE COMMANDER

59.1 The apparatus shall be equipped with a Detroit Diesel Electronic Fire Commander. It shall be connected directly to the DDEC IV Electronic Control Module (ECM) mounted on the engine. The Electronic Fire Commander shall operate as a throttle and operate the pressure sensor governor eliminating the need for a relief valve on the discharge side of the pump. _____

59.2 The Electronic Fire Commander shall display engine information and critical warnings, such as engine temperature, oil pressure, engine RPM, and voltage in a single weatherproof, highly visible digital display. _____

59.3 A special preset feature shall permit a predetermined pressure or RPM to be set. The preset pressure or RPM shall be displayed at the message display of the Electronic Fire Commander and shall be easily adjustable by the operator. _____

59.4 The display module shall be mounted at the pump operator's panel. _____

60.0 WATER TANK LEVEL GAUGE

60.1 One (1) Innovative Controls brand water tank level gauge shall be located at the pump operator's panel to provide a high-visibility display of the water tank water level. _____

60.2 Fourteen (14) high-intensity light emitting diodes (LED's) on the display module shall form an inverted "V" pattern allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance. _____

60.3 The display module shall be protected from vibration and contamination. The components shall be encased in an encapsulated plastic housing. _____

60.4 Colour-coded cover plates shall complete the assembly of the display module to the pump panel.

60.5 System calibration shall be accomplished via five (5) small adjustment screws, one for each level, located on the face of the display module. Each display level shall be set independently for maximum reliability. _____

60.6 The display shall provide a steady indication of fluid level despite fluid movement inside of the tank when the vehicle is in motion. _____

61.0 FOAM TANK LEVEL GAUGE

61.1 There shall be an Innovative Controls foam tank level gauge located at the pump operator's panel. The gauge shall provide a high visibility display of the foam tank foam level. _____

61.2 Fourteen high intensity LED's on the display module shall form an inverted "V" pattern allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance. _____

61.3 The display module shall be protected from vibration and contamination with the components being encased in an encapsulated plastic housing.

61.4 Colour coded cover plates shall complete the assembly of the display module to the pump panel. _____

61.5 The probe shall fit easily in the tank and it shall have a removable tip on the probe that allows the probe shaft to be cut to fit the tank. Once the probe is cut to length, the internal cable connector shall be attached and the tip is secured in place. _____

61.6 The design of the sensing probe shall prevent fluid entry into the probe and eliminate cleaning procedures commonly associated with level measuring probes. _____

61.7 Internal electronics shall be protected with encapsulated plastic. _____

61.8 System calibration shall be accomplished via five (5) small adjustment screws, one for each level, located on the face of the display module. Each display level shall be set independently for maximum reliability. _____

61.9 The display shall provide a steady indication of fluid level despite fluid movement inside of the tank when the vehicle is in motion. _____

62.0 PUMP COOLER

62.1 The pump shall have a 3/8 inch line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. _____

62.2 The pump cooler line shall be controlled from the pump operator’s panel by a 3/8 inch snubber valve. _____

63.0 FLOW METER VALUE SYSTEM

63.1 The apparatus shall be equipped with a Class 1 Flow Meter on the specified discharge to digitally display the actual volume of water (in gallons per minute) being discharged through the specified line and the total volume of water that has flowed through the specified line. The total volume of water that has flowed through the specified line shall also be displayed when the totalizer button is depressed and held. _____

63.2 Flowminder shall consist of:

1- Weatherproof digital flow display with super-bright digits at least 1/2 inch high. The display shall read actual flow and shall switch to total flow when the totalizer button is depressed and held. _____

2- Flow transmitter mounted in the discharge line piping between the pump and the discharge outlet. _____

3-The transmitter shall consist of a weather resistant black anodized housing with brass wetted parts with a double paddle wheel. _____

4-Connecting cables to connect the digital display to the flow transmitter and apparatus power. _____

5- Machined mounting hardware to hold the transmitter in position in the discharge line. _____

6-The flow meter shall be checked and calibrated prior to delivery of the apparatus. _____

7-The bezel shall match the colour of the valve control tag. _____

64.0 FOAM SYSTEM

64.1 Foam Pro 2001 or 2002 required. Shall be a fully automatic electronic direct injection foam proportioning system furnished and installed in accordance with the manufacturer recommendations on the apparatus for the specified discharge(s). The system shall be capable of Class A foam concentrates and most Class B foam concentrates. _____

64.2 The proportioning operation shall be based on an accurate direct measurement of water flows with no water flow restriction. The proportioning system shall meet NFPA standards for foam proportioning systems and the design shall have passed testing against SAE automotive reliability standards appropriate for the application. _____

64.3 The system shall be equipped with a digital electronic control display. It shall be installed on the pump operators panel and enable the pump operator to perform the following control and operation functions:

a)- Activate the foam system. _____

b)- Change foam concentrate proportioning rates from .1% to 3% in .1% increments. _____

c)- From discharges plumbed after the paddlewheel type flow meter: shall show current flow in gpm, show total volume of water pump, show total amounts of foam concentrate used. _____

d)- Provide simulated flow for manual operation. _____

e) Perform set-up and diagnostic functions. _____

f) Flash a "low concentrate" warning for two minutes when the foam concentrate tank(s) run low of concentrate. _____

g) Flash "no concentrate" warning if foam concentrate tank was not changed or foam concentrate was not added to the low tank and shut down foam concentrate pump. _____

64.4 The display shall have the capabilities when using a Hypro/FoamPro manual or electronic dual tank switching system of the following additional functions:

a) Display which foam concentrate tank is selected (tank A: PA or tank B: PB) _____
b) Separate default setting for foam concentrate injection rate. _____
c) Total amount of foam concentrate used from selected tank. _____
d) Dual foam concentrate foam pump calibration. _____

64.5 The foam system shall have a 12 volt, 1/2 hp "TENV" electric motor designed for wet and high humidity environments, direct coupled to a positive displacement piston type foam concentrate pump with a rated capacity of .01 to 2.6 gpm with operating pressures up to 400 psi. _____

65.0 VIEWPOINT LIGHT BARS

65.1 A Federal Model FV2251 six (6) pod ViewPoint light system shall be mounted on the forward part of the cab roof. _____

65.2 The system shall include two (2) individual three (3) pod units. Each pod unit shall have two (2) 95FPM rotators and one (1) oscillating light. The lens configuration shall be R/C/R/C/R/R. The two (2) oscillating lights shall be switched off in the blocking right of way mode. (Pods 2 & 5 may be wired through the load manager). _____

66.0 TRAFFIC ADVISOR SMLED-6

66.1 A Federal SML-6 Traffic Advisor light bar with amber lens shall be installed at rear of the apparatus as specified. The unit shall include a total of six (6) LED (light Emitting Diode) modules. Four operating modes are available: left arrow, right arrow, split (center out) and flashing warn pattern. A Federal SMC-56 control shall be provided with LED indicators to emulate the warning pattern. _____

67.0 SIREN SPEAKER

67.1 One (1) Federal model MS-100-01 Dynamax 100 watt speaker shall be flush mounted behind the front bumper. The speaker shall meet NFPA requirements for sound output producing a minimum 120 dB of sound at 10 feet. _____

68.0 ELECTRICAL SYSTEM

(Body Wiring)

68.1 All body electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA Apparatus Standard. Twisted-pair shielded wire shall be provided within the electrical system for noise reduction. _____

68.2 The wiring harness shall conform to SAE J-1128 with GXL temperature properties. All exposed wiring shall be run in a loom with a minimum 289 289-degree Fahrenheit rating. _____

68.3 All wiring looms shall be properly supported and attached to body members along the entire run. All wiring shall be mounted so as to provide protection from water and heat. _____

68.4 All connections shall be soldered with heat shrink tubing with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system. At any point where wire or looms must pass through metal holes, rubber grommets shall be installed in the holes to protect the wire from abrasion. _____

68.5 Wiring shall be individually and permanently function-labeled and colour-coded every three (3) inches on the insulation to allow for easy identification. _____

68.6 The main low voltage chassis to body interface point and distribution panel shall be provided at the front of the body in a location providing easy service access. The distribution panel shall be labeled and shall contain body electrical relays and wire connection bar. The distribution panel shall be located so as not to reduce useable compartment space. _____

68.7 An electrical harness quick-disconnect connection shall be provided to facilitate removal of the body in the future. All circuits shall be protected with automatic reset circuit breakers to ensure reliability of the system. _____

68.8 All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. Emergency warning light switches shall be of the rocker type. For easy night time operation, an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function. _____

69.0 MAIN CONTROL SYSTEM

69.1 The apparatus shall have an in-vehicle electrical networking system, also known as multiplexing, to provide real-time or current-state diagnostic capability and reduce troubleshooting or down time when compared to a standard point to-point wiring system. _____

69.2 Due to the unique features and capabilities of a multiplexed electrical system, **NO EXCEPTION** will be allowed to clause 69.0. _____

69.3 The system shall have the capability of delivering multiple signals, utilizing specifications set forth by SAE J1939. _____

69.3 The networked system shall meet the following minimum requirements;

Components are as follows:

1- Universal System Manager (USM) containing the main processor and load manager. _____
2- Integrated load management functions such as load shedding. _____
3- Self-contained LED diagnostic indicators:

- PWR for input power status (red) _____
- power status (yellow) _____
- COM for communication status (green) _____
- Power Distribution Module - input/output modules _____
- Switch input capability _____
- Solid-state circuitry _____
- Responsible for lighting device activation _____
- Diagnostic display for warning message indication _____
- Vocation Module to allow for failsafe pumping operations in the event of a fault occurrence within the multiplex system _____

69.4 The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem and phone line to allow remote diagnostics, troubleshooting, or program additions. The system shall include the ability for to allow diagnosis by a hand held PDA (i.e. Palm Pilot), **NO EXCEPTIONS.** _____

69.5 There shall be a diagnostic display provided in the cab. The diagnostic display shall allow for fault and condition messages to be displayed providing to provide the operator of with detailed messages, such as which compartment door is ajar. The display shall allow for complete diagnostic capability without the use of additional hardware or software. _____

70.0 CAB AND BODY LIGHTING

Non-Warning Lighting

70.1 Clearance lights and reflectors shall be installed in conformance to the latest Federal DOT standards. Clearance lights and reflectors shall include two (2) red clearance lights,

four (4) red rectangular reflectors, two (2) amber rectangular reflectors, and three (3) red marker lights centred at the rear step, recessed in the rubrail for protection.

70.2 There shall be rectangular-shaped marker light with an amber-coloured lens installed on either side of the apparatus body at the front of the body and just forward of the rear axle. The marker light shall be wired to the turn indicator. Marker lights at the front of the body shall be mounted in the rubrails of the body for protection.

70.3 There shall be a rectangular-shaped marker light with a red-coloured lens installed at the trailing edge on either side of the apparatus body. The marker lights shall be recessed in the rubrails for protection.

70.4 One (1), 7 inch red and one (1), 7 inch clear Weldon model 1010 light shall be installed on each side of the vehicle rear. Light functions shall include running lights, brake lights, turn signal lights and back-up lights.

70.5 There shall be a license plate light installed at the rear of the vehicle.

70.6 Three (3) Weldon #2030 lights shall be mounted under a light shield directly above each pump panel. The work light switch in the cab shall activate the lights when the park brake is set.

Compartment Lighting

70.7 There shall be a minimum of one (1), 4 inch, circular, single bulb light mounted in each body compartment. Compartment lights shall be wired to a master on/off rocker switch on the cab instrument panel. Each light shall be in a resilient shock shock-absorbent mount for improved bulb life.

70.7.1 Multiple 4 inch, circular, single bulb lights shall be supplied in compartments with multiple shelving for total illumination.

70.8 The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water and corrosion-resistant switch and sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

70.9 The compartment light switch shall also be wired to activate a 2 inch red flashing light located in the cab to alert the driver that a body door is open. The door ajar warning light shall be interlocked through the parking brake to eliminate prevent the light from flashing when the vehicle is being serviced or the master/ignition switch is in the on position.

70.10 There shall be a compartment light with a switch installed to illuminate the pump area for service.

Step Lights

70.11 There shall be a minimum of four (4), recessed 4 inch lights with a clear lens provided to illuminate the rear step area. Step lights shall be activated with the work lights switch in cab after the park brake is set.

70.12 The apparatus shall have sufficient lights to properly illuminate the work areas, steps, walkways and ground areas around the apparatus in accordance with current NFPA requirements.

70.13 Areas under the driver and crew area exits shall be activated automatically when the exit doors are opened. Ground area lights shall be switched from the cab dash with the work light switch.

71.0 BACK-UP ALARM

71.1 There shall be an electronic back-up alarm supplied at the rear of the apparatus. The 97 dB(A) alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse. _____

72.0 ELECTRICAL SYSTEM LOAD MANAGER

72.1 The vehicle's electrical system shall be equipped with an integrated load management device. The load manager shall be a one-touch device designed so that it shall be protected against reverse voltage and electrostatic damage. _____

72.2 Electrical load shedding shall be tied through the parking brake. Electrical loads shall shed only during stationary operations. Only devices not required for stationary operation, in accordance with current NFPA requirements, will be available for load shedding. _____

72.3 Electrical loads shed during stationary operation will be reactivated when the park break is released. _____

72.4 Automatic fast idle activation shall occur before load shedding. The fast idle shall automatically activate whenever the parking brake is set and the system voltage drops below 12.8 volts for at least one 1 minute. _____

72.5 The fast idle is to remain on for a minimum of 10 minutes and until a minimum of 13.0 volts are achieved. The fast idle function is to be automatically cancelled if the park brake is released, there is loss of neutral safety, pump is shifted into gear, or the service brake is depressed. _____

72.6 The load manager system shall include the following features:

- Main battery monitoring _____
- Visual and audible low voltage alarm control. _____
- Digital display for diagnostics and status information. _____
- Test button to cycle all loads and the ability to verify load shedding sequences without draining the battery. _____
- Override switch shall be provided, with label, to override operation of the management system, per N.F.P.A requirements. _____

72.7 The apparatus low voltage electrical system shall be tested in accordance with current NFPA 1901, requirements. A third third-party testing service shall perform testing and certification. _____

73.0 MULTIPLEX MODEM KIT

73.1 A kit shall be supplied to include modem, adapter for PDA device/laptop computer interface and adapter harness. The diagnostic hookup shall be located under the officer's side dash. _____

74.0 MULTIPLEX DATA LOGGER

74.1 The data logger shall record historical faults within the multiplex system and be accessible through the diagnostic software as well as the information centre. _____

75.0 ELECTRONIC SIREN

75.1 One (1) Federal Signal model PA300M solid state electronic siren with attached noise cancelling microphone shall be installed. The unit shall be capable of driving high-power speakers up to 200 watts to achieve a sound output level that meets Class "A" requirements. Operating modes shall include hi-lo, yelp, wail, P.A., air horn, and radio re-broadcast. It shall include a Tap II feature. _____

76.0 LED MARKER LIGHTS

76.1 Trucklite LED clearance/marker lights shall be installed as specified:

Upper Cab:

- Five (5) amber LED clearance lights on the cab roof. _____

Lower Cab:

- One (1) amber LED side turn/marker each side of cab ahead of the front door hinge. _____

Upper Body:

- One (1) red LED clearance light each side, rear of body to the side. _____

Lower Body:

- Three (3) red LED clearance lights centered at rear, recessed in the rubrail. _____
- One (1) red LED clearance light each side of the body, recessed in the rubrail. _____
- One (1) amber LED clearance light each side front of body just in front of rear wheels, recessed in the rubrail. _____
- One (1) amber LED clearance/auxiliary turn light each side front of body, recessed in the rubrail. _____

77.0 FEDERAL VECTOR LIGHTS

77.1 Two Federal Signal model IVP-200 Individual Vector Pods shall be supplied, one each side at the rear of the vehicle. Each unit shall consist of a 175 FPM rotating light and a clear Vector Dome. An amber insert shall be provided for both sides rotating light. A forward facing floodlight operated by a separate dash switch shall provide light into the hosebed of the vehicle. _____

78.0 LOWER LEVEL LIGHT PACKAGE

78.1 Ten (10) Federal GS5-R-SB FireRay strobe warning lights, all with red lenses, shall be provided. Lighting shall be mounted as follows:

- Zone A - Two GS5-R FireRay strobe lights on the front of the apparatus facing forward. _____
- Zone B - Three GS5-R FireRay strobe lights, one at the forward most point (as is practical), one surface mount midship, and one at the rearward most point (as is practical). _____
- Zone C - Two GS5-R FireRay strobe lights on the rear of the apparatus facing rearward. _____

- Zone D - Three GS5-R FireRay strobe lights, one at the forward most point (as is practical), one surface mount midship, and one at the rearward most point (as is practical).

78.2 Three Federal SPS4P-NFPA power supplies shall be provided.

78.3 A lighted rocker switch on the cab instrument panel, labelled lower level warning, shall control the lights.

78.4 Lower level devices shall be mounted in compliance with NFPA standards.

79.0 SCENE LIGHTS

79.1 Two (2) Federal GHSCENE lights with clear lenses shall be provided. Each light shall include (2) 20 watt halogen fixtures within the light housing. Both lights, within the housing, shall be adjustable horizontally and vertically to provide desired coverage.

79.2 All electrical connectors are to be enclosed in the housing providing protection against the elements.

79.3 The lights shall be 12VDC, total of 40 watts, and provide a minimum 1050 candelas.

79.4 Lights shall be located one (1) each side on the apparatus cab.

80.0 4 PLACE STROBE POWER SUPPLY

80.1 One (1) Federal Signal SPS4 NFPA four (4) place strobe power supply shall be installed. The 12-volt power supply shall have an output of 22.5 watts per pair of lights with a total output of 90 watts. The power supply shall be able to control and flash strobes in pairs.

81.0 DECK LIGHT WIRING

81.1 The rear deck lights shall be activated when the chassis is placed in reverse to provide additional lighting, in addition to the back-up lights, when backing the vehicle.

82.0 TAIL LIGHTS

82.1 Two (2), Whelen model 600 series L.E.D. (Light Emitting Diode) lights with one (1) Whelen 600 series halogen light shall be installed, each side at rear, in place of standard and wired with weatherproof connectors.

82.2 Light functions shall be as follows:

- L.E.D. red running light with red brake light in outboard position.
- L.E.D. amber turn signal in middle position.
- Halogen 27 watt clear backup light in lower position.

82.3 A one-piece polished aluminum trim casting shall be mounted around the three (3) individual lights in a horizontal position.

83.0 10,000 WATT HYDRAULIC GENERATOR

83.1 An Onan 10KW side draft hydraulic generator, model #10RBAA, shall be provided and installed in a location defined by the City of Winnipeg Fire Paramedic Service.

83.2 The unit shall come equipped with: modular generator unit (which includes the hydraulic motor and filter, generator, and cooler), variable displacement hydraulic pump, hydraulic reservoir & a gauge panel. _____

83.3 The gauge panel shall display voltage, hour meter, frequency, and amperage. _____

83.4 The hydraulic motor, generator, blower, cooler, and necessary hydraulic components shall be enclosed in a stainless steel housing. The housing is lined with acoustical, sound suppression material to reduce noise levels. _____

83.5 The reservoir shall be mounted separately. _____

83.6 The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO). A PTO engage switch and Generator Control switch shall be mounted on the cab instrument panel to engage the PTO and start the generator. _____

Ratings and Capacity

Rating:	10,000 watts continuous	_____
Volts:	120/240 volts	_____
Phase:	Single, 4 wire	_____
Frequency:	60 Hz	_____
Amperage:	83.30 amps @ 120 volts or 41.60 amps @ 240 volts	_____
Engine speed at engagement:	Below 1000 RPM	_____
Operation range:	975 to 2500 RPM 600 to 2500 RPM Aerial Only	_____

83.7 The generator shall be tested operating at 100 percent of its name plate voltage for a minimum of 2 hours in accordance with current N.F.P.A. 1901 standards. Shall meet CSA/ULC Electrical Standards (ground fault etc..) _____

Notes

*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.

84.0 TELESCOPIC QUARTZ LIGHTS

84.1 Two (2) Kwik-Raze model 36 Magnafire quartz light head with 650-watt, 120-volt halogen IR bulb rated at 25,200 Lumens mounted on a Kwik-Raze model 500 bottom raising aluminum telescopic pole with up indicator switch. _____

84.2 The light assembly shall be externally mounted as at the rear of the cab (one each side). The pole shall allow for 360-degree rotation of the light. A locking knob shall hold the pole at the desired height. _____

85.0 BREAKER PANEL

85.1 A ten (10) place breaker box with up to ten (10) appropriately sized ground-fault interrupter circuit breakers shall be supplied. The breaker box will include a master breaker sized according to the generator output. The breaker box will be located in the specified compartment, not to exceed 12' run of wire. _____

86.0 ELECTRIC CORD REEL

86.1 A permanently mounted Hannay model ECR 1616-17-18 electric rewind electric cord reel with 200 feet of yellow 10 gauge 3 conductor type SOWA cord 20 amps @ 110 volts shall be installed. The cord shall be terminated at the end. _____

86.2 A rewind button shall be shall be installed. _____

87.0 CORD REEL ROLLERS

87.1 Stainless steel rollers shall be installed for the electric rewind cord reel to facilitate smooth removal of the electrical cord. _____

88.0 CIRCLE D JUNCTION BOX WITH WALL MOUNT

88.1 A Circle D PF51F-3 powerbox with four (4) 15 Amp 110-Volt twist lock receptacle's NEMA L5-15 shall be hardwired to the cord reel. The receptacles shall be enclosed in a ULC listed, NEMA Type 3R cast aluminum box with aluminum finishes and NFPA required indicator light. _____

89.0 CIRCLE D MOUNTING BOX

89.1 A Circle D model #213 cast aluminum mounting box shall be installed for the Circle D junction box. _____

90.0 PLATFORM PRECONNECT

90.1 A 2 1/2 inch NST outlet shall be located externally on the front centre of the platform. This outlet shall come equipped with a 30 degree chrome elbow and a 2 1/2 inch x 1 1/2 inch chrome reducing cap and chain. This shall allow the use of 2 1/2 inch or 1 1/2 inch hose from this outlet. _____

91.0 HOSE BOX

91.1 A hinged covered hose box shall be mounted at the platform. The box shall have sufficient capacity to hold 50 feet of 1-1/2 inch double jacket coupled fire hose and pistol type automatic nozzle. _____

92.0 REAR 4 INCH AERIAL WATERWAY INLET

92.1 One (1), 4 inch inlet shall be provided at the rear of the apparatus and shall be connected to the vertical pedestal waterway piping to supply water to the aerial waterway from an outside source. All fabricated piping shall be constructed of stainless steel piping. _____

92.2 A 4 inch, NST chrome-plated male adapter with a long-handle chrome-plated 4inch NST cap shall be installed on the inlet. _____

93.0 WATERWAY PRESSURE GAUGE

93.1 One (1) weatherproof 2-1/2 inch, liquid filled, compound vacuum pressure gauge with a range of 30-0-600 shall be installed adjacent to the waterway inlet to advise the aerial operator of the pressure within the waterway. _____

93.2 Shall be a 1 1/2 inch or 2 1/2 inch waterway drain for the aerial. Drain shall be accessible to connect hose for drainage away from unit. _____

94.0 REAR INLET VALVE

94.1 A valve shall be installed in the waterway to permit the rear inlet to be used as a discharge. The valve control shall be rear mounted and labelled to indicate open or closed. _____

95.0 AERIAL WATERWAY FLOWMINDER

95.1 The aerial shall be equipped with a Class 1 Flowminder for the aerial waterway to digitally display the actual volume of water (in gallons per minute) being discharged and the total volume of water that has flowed through the waterway. _____

95.2 A dual readout shall be supplied with one display mounted at the turntable control station and the second display mounted near the platform control console at the front of the platform. _____

Flowminder shall consist of:

1- Weatherproof digital flow display with super-bright digits at least 1/2 inch high. The display shall read actual flow and shall switch to total flow when the totalizer button is depressed and held. _____

2- A dual output transmitter shall be utilized to run both displays from a single reading point at the base of the waterway plumbing above the hydraulic/electric swivel. The transmitter shall consist of a weather resistant black anodized housing with a double paddle wheel. _____

3- Connecting cables to connect the digital display to the flow transmitter and apparatus power. _____

4- Machined mounting hardware will hold the transmitter in position in the discharge line. _____

5- The flowmeter shall be checked and calibrated prior to delivery of the apparatus. _____

96.0 TIP SPOTLIGHT

96.1 One (1) Unity model AG-S-4413 spotlight shall be supplied at the tip of the aerial ladder. Spotlight shall have a chrome-plated housing and a pivot base to allow movement of the light. _____

97.0 STROBE LIGHTS ON PLATFORM

97.1 The aerial platform shall be supplied with one Whelen model 73 strobe (or equivalent) mounted on each side of the platform ground bumpers. The lenses shall be coloured red. A weather resistant universal power supply WRPS-64C with comet flush and sealed housing shall be supplied. The strobe lights shall activate when controls are switched from jacks to ladder. _____

98.0 LADDER BASE LIGHTING

98.1 Two (2) Unity model AG-S-H floodlights shall be mounted at the bottom of the ladder base section, one on each side. They shall be controlled from the turntable-operating pedestal.

99.0 QUARTZ LIGHT

99.1 Two (2) Kwik-Raze model 36 Magnafire quartz light head with 650-watt 110-volt halogen IR bulb rated at 25,200 Lumens mounted on a Kwik-Raze model 200 top raising aluminum telescopic pole with up indicator switch.

99.2 The light shall be fitted with a weather resistant switch and connected to the aerial tip power circuit and shall be mounted in the area between the platform and ladder fly section.

99.3 The pole shall allow for 360-degree rotation of the light. A locking knob shall hold the pole at the desired height.

100.0 REAR LADDER STORAGE

100.1 A ladder storage tunnel shall be provided beneath the aerial device frame work. The ladder tunnel shall have a minimum storage capacity for the 115 feet of ground ladders as per NFPA 1901, with access to the ladders via an opening at the rear.

100.2 The tunnel shall be lined with aluminum. The ladders will be held captive top and bottom by aluminum tracks and slide on friction reducing material.

100.3 All ladders shall be removable individually without having to remove any other ladder. A quick release, device shall keep the ladders secured in the storage area.

101.0 REAR PIKE POLE STORAGE

101.1 Pike poles storage shall be provided at the rear of the body for six (6) pike poles. The storage area shall be labelled for two (2) 6' poles, two (2), 8 foot poles, and two (2), 12 foot poles. The pike poles shall be secured by either slotted locking tubes and/or diamond plate door(s).

102.0 AERIAL PLATFORM BREATHING AIR SYSTEM

102.1 The aerial device shall be supplied with a breathing air system as outlined in NFPA 1901 18-7.7 and section 23-5. The air system shall hold a total of 888 cubic feet of air carried in two DOT 444 cubic foot cylinder rated at 4500 psi.

102.2 The air tank shall be painted yellow and marked with a label that read ''High Pressure 4500 psi Breathing Air''.

102.3 The tank shall be mounted in accordance with NFPA 1901 23-5.7 and include a guard to protect the valve on the cylinder end.

102.4 All components of the piping system shall have a 3 to 1 safety margin. There shall be a high pressure regulator supplied at the base of the aerial to reduce the air pressure to no more than 125 psi up the aerial.

102.5 All valves fittings and hoses shall be constructed of corrosion resistant material. A pressure relief valve set at 1 1/2 times working pressure shall be supplied to relieve the air lines in the event of a pressure regulator failure.

102.6 An air mask box shall be provided to store breathing air masks at the tip as outlined in NFPA 1901 18-7.7.4.

102.7 A low air breathing alarm shall be provided as outlined in NFPA 1901 chapter 18-7.7.5. The low air warning system shall provide an audible and visual warning when the air volume is at or below 20 percent. _____

102.8 Quick connect air supply manifold conveniently located within platform which would allow three (3) firefighters to directly couple to the main aerial, air supply bottles. _____

102.9 Four (4), MSA, lightweight 4500psi SCBA's, c/w with quick connect fittings and hoses, to be mounted in the cab seats with spare bottles in compartments. _____

103.0 THIRD-PARTY FLOW TEST

103.1 A flow test shall be conducted to determine that the water system is capable of flowing 1,000 gpm at 100 psi nozzle pressure with the aerial device at full extension and elevation. Intake pressure for the onboard pump shall not exceed 20 psi. _____

103.2 In addition to the flow test, a hydrostatic test shall be done on the waterway system. The permanent water system, piping, and monitor shall be hydrostatically tested at the maximum operating pressure required to flow 1,000 gpm at 100 psi nozzle pressure at maximum elevation and extension. _____

103.3 These results shall be certified by an independent, third-party testing organization, per NFPA 14-13.1 through 14-13.1.3. _____

104.0 STOKES BASKET RECEIVER

104.1 A stokes basket receiver shall be supplied. The platform shall be designed to allow the receiver to slide into a mounting bracket in the right front corner of the platform. The receiver shall be designed to securely hold a stokes basket for transportation of a victim. _____

104.2 The system shall allow for 260 degree rotation of the stokes basket while it is secured to the platform to allow easier access to the victim. _____

105.0 GROUND LADDERS (shall meet NFPA 1901, ground ladder requirements)

105.1 The following ground ladders shall be supplied and mounted on the apparatus;

1- One (1) Alco-Lite FL-10, 10 foot aluminum folding attic ladder shall be provided. Both ends shall be equipped with molded rubber feet and the ladder shall have handles for easy carrying. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. _____

2- One (1) Alco-Lite PRL-16, 16 foot aluminum roof ladder shall be provided. A pair of folding 3/4 inch (0.75inch) steel roof hooks shall be attached to one end of the ladder, and a pair of steel spiked feet on the other end. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. _____

3- One (1) Alco-Lite PEL-24, 24 foot aluminum two-section extension ladder shall be provided. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. _____

4- One (1) Alco-Lite PEL-35, 35 foot, two-section extension ladder shall be provided. _____

5- The ladder shall meet or exceed the requirements of the current edition of NFPA 1931. _____

106.0 REDUCER

106.1 A chrome 2-1/2 inch x 1-1/2 inch reducer shall be supplied for the platform discharge. _____

107.0 STORZ SWIVEL 4INCH FNST X 4INCH 30DEGREE ELBOW

107.1 An aluminum, Storz swivel, 4 inch female NST x 4 inch, 30^{o} (degree) elbow adapter with a tethered cap shall be supplied for the rear waterway discharge. _____

108.0 STOKES FERNO WASHINGTON MODEL 71

108.1 A Ferno Washington Model # 71 orange stokes shall be supplied. The stokes basket shall include four orange nylon tie-down straps approximately four feet in length. The straps shall have a loop on one end with male/female seatbelt type buckles at the other end. _____

109.0 AERIAL INSPECTIONS

109.1 A qualified representative/s of the manufacturer shall arrange with the Contract Administrator, three (3), on site inspections at different intervals to perform an inspection of the aerial device only. The purpose of the visits, are to assist the City of Winnipeg with preventive maintenance practices and operational checks on the aerial device. The visits, may be performed at a City of Winnipeg Fire Station, or, at a location of the Contractor's choice which shall be agreed upon by the Contract Administrator, within the boundaries of the City of Winnipeg. All costs associated with moving the vehicle to the inspection location shall be the responsibility of the City of Winnipeg. _____

109.2 The vehicle inspection shall take no longer that two (2) calendar days to perform during the aerial inspection visits. All travel costs of the representative shall be the responsibility of the manufacturer. _____

109.3 The aerial inspection visit shall be scheduled by the manufacturer at approximately 6 / 12 / and 24 months after initial training. _____

109.4 During the 6 and 12 month visit, any aerial warranty items found shall be adjusted or repaired at the time of inspection. _____

109.5 During the 24 month visit any items which need repair shall be reported to the Director of Mechanical Services, Fire Paramedic Services City of Winnipeg. The inspection shall include the following as a minimum but not limited to:

1- 6 month / 12 month / 24 month inspection _____

2- Inspection of electrical system 12V / 24V. _____

3- Inspection of all fluid levels. _____

4- Inspection of the safety limit switches / retarders / interlocks / deadman switches. _____

5- Inspection of hydraulic pressure / main pump / emergency pump and relief valve settings. _____

6- Inspection of hydraulic valve operation (manual / electric). _____

7- Inspection of hydraulic telescopic and levelling systems. _____

8- Inspection of emergency back up systems (manual / electronic). _____

9- Inspection of waterway seals. _____

10- Inspection of PTO. _____

11- Inspection of extension / retraction and levelling chain operation. _____

12- Assist the customer with service / preventive maintenance and operational checks. _____

110.0 AERIAL CERTIFICATION

110.1 The completed apparatus shall be tested and certified at the manufacturer's facility by an independent testing organization as outlined in NFPA 1901 16-24. The aerial device shall be inspected and tested utilizing NFPA 1914 Standard for Testing Fire Department Aerial Devices. _____

110.2 All aerial testing shall utilize non-destructive examination methods. _____

110.3 All quality control testing shall be performed by an ASNT or CGSB certified level II Non-Destructive Testing Technician. _____

110.4 All sub assemblies shall be inspected before mounting. Each boom section shall be tested prior to the assembly of the complete aerial device. _____

110.4 A magnetic particle test shall be conducted on the torque box, aerial support structure, outriggers, outrigger support structure and all the weldments on the boom sections. _____

110.5 All turntable mounting bolts, cylinder anchor pins, outrigger anchor pins, aerial hinge pins and other critical mounting components are subjected to ultrasonic testing for flaw detection. _____

110.6 After the aerial is assembled, an operational inspection shall be made following the guidelines in NFPA 1914 and 1901. The tests shall include and not be limited to the following:

1- A level surface stability test shall be conducted as outlined in NFPA 1901 16-24.2. The test shall involve setting the apparatus on a level surface with stabilizers deployed and attaching a load of 1.5 times the rated capacity in the position of least stability. The stability test shall include a factor of 1 time the water load and nozzle reaction force in the worst case position. _____

2- The apparatus shall also be subject to a 5 degree slope stability test as outlined in NFPA 1901 16-24.3. The test shall involve setting the apparatus up facing downhill with stabilizers deployed in the position most likely to cause overturning and attaching a load of 1 1/3 times the rated capacity to the platform. The apparatus shall show no signs of instability. _____

3- The aerial shall lift its rated tip load capacity at maximum side reach at 0^{o} (degrees) elevation and rotate 90^{o} (degrees) to the side of the apparatus. A test weight of 1.5 times the rated tip load shall be placed at the platform and rotated at 0^{o} (degrees) through 360^{o} (degrees) to demonstrate stability. The test shall be conducted with all removable equipment such as tools, hose, water, personnel and ladders off the vehicle. _____

4- A test weight of 2 times the rated load shall be attached to the platform at maximum extension at 0^{o} (degrees) for ten minutes. The boom shall be checked for any abnormal twist or deflection. _____

5- Upon satisfactory completion of the tests, a certified independent testing organization shall submit a certificate of inspection indicating that all specified standards have

been met.

111.0 WARRANTIES

111.1 **Standard Warranty**

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier.

111.2 **Polypropylene Tank Warranty**

The apparatus manufacturer shall provide a full lifetime polypropylene tank warranty. This warranty shall cover all defects in materials or workmanship of the polypropylene tank for the lifetime of the covered apparatus with its original owner.

111.3 **Plumbing Components Warranty**

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years.

111.4 **Aerial Device - Twenty Year Structural Integrity Limited Warranty**

The aerial manufacturer shall provide a 20 year structural integrity warranty on the aerial device. This warranty shall cover structural components and shall be extended for a period of 20 years after the date on which the vehicle is delivered to the City of Winnipeg.

111.5 **Roll-up Doors (Paint)**

Shall have a 5-year limited warranty covering the paint system.

111.6 **Booster Tank**

To ensure timely service support and sole warranty responsibility, the tank shall be warranted by the apparatus builder. A lifetime manufacturer's statement of warranty shall warrant each tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle.

111.7 **Foam Tank**

Shall have a lifetime manufacturer's limited warranty.

111.8 **Discharge Manifold**

The apparatus manufacturer shall provide a full 10 year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years..

Note- Complete copies of all warranties must be submitted within forty eight (48) hours of a request by the Contract Administrator.

SECTION 2- CHASSIS SPECIFICATIONS

112.0 TYPE

112.1 Shall be a front engine, rear wheel drive, Fire truck apparatus consisting of a tandem axle chassis and a low entry, four door cab. _____

-state make and model of chassis being bid. _____

113.0 PERFORMANCE

113.1 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 snow fall of approximately 42 inches (1 070 mm). The apparatus when not in use will be stored in a heated building.

113.2 The apparatus shall be capable of carrying a driver and five (5) 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. _____

114.0 GVWR, DIMENSIONS AND TURNING RADIUS

114.1 Gross vehicle weight rating (GVWR) _____

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

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

114.4 State the tare weight of the apparatus being bid:

- Front _____
- Rear _____
- Total _____

114.5 State the weight distribution of the apparatus with the water filled:

- Front _____
- Rear _____

114.6 State the following dimensions:

a) Overall width – state. _____

b) Overall height – 144 inches maximum. _____

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

c) Overall length – 48 feet, maximum. _____

d) Wheel base preferred- 250 inch- 255 inch, axle to axle maximum. _____

e) Ground clearance – 8 inches, minimum. _____

f) Approach and departure angle – state. _____

114.7 State the vehicle turning radius, to-wall, measured as per SAE J695, 35ft., _____

115.0 ENGINE AND ENGINE EQUIPMENT

115.1 Engine – 6 cylinder, 12 litre class, turbo charged, air-to-air after cooled, 4 cycle diesel. Detroit engine preferred or as recommended by the manufacturer. State. _____

115.2 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 within forty eight (48) hours of a request by the Contract Administrator. _____

115.3 Engine- front mounted. _____

115.4 Engine governor – electronic, compatible with fire pumper operation. _____

115.5 Oil drain plug – magnetic type. _____

115.6 Oil filter– as recommended by the engine manufacturer, The filter shall be remote mounted such that it is easily accessible for servicing from underneath the vehicle. _____

115.7 Fuel filter, primary – As recommended by the engine manufacturer, remote mounted on the chassis frame such that it is easily accessible for servicing. _____

115.8 Fuel filter, secondary (if recommended) spin-on filter. The filter shall be remote mounted on the chassis frame such that it is easily accessible for servicing. _____

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

115.10 Air cleaner – heavy duty replaceable element, dry type, or as recommended by the engine manufacturer. _____

115.11 Emergency shutdown – air intake flap valve, preferred. State. _____

115.12 Engine brake- a Jacobs engine brake shall be installed to retard the engine. The Jake brake shall have an override switch that automatically deactivates the brake whenever the accelerator is depressed. An interlock system shall be used and allow activation only when the transmission is in _____

115.13 A fast idle system shall be provided and controlled by the cab mounted or pump panel-mounted switch. The system shall increase engine idle speed to a preset RPM for increased alternator output. (The cab dash has a position for the switch by default, if the switch is to be located on the pump panel it must be noted as to location. _____

115.14 Engine Immobilizer- required if available. Wired into brake system or transmission or combined brake/transmission, or as recommended by the manufacturer. State make, model and type. _____

116.0 ENGINE COOLING SYSTEM

116.1 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). _____

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

116.3 Fan drive – thermostatically controlled clutch fan preferred. State. _____

116.4 Coolant – ethylene glycol based extend life coolant protected to-40°F compatible with the engine. _____

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

116.6 Hoses – as recommended by manufacturer. _____

116.7 Hose clamps – as recommended by manufacturer. _____

117.0 ELECTRICAL SUPPLY SYSTEM

117.1 The cab and chassis system shall have a centrally located electrical distribution area. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. _____

117.2 An automatic thermal-reset master circuit breaker compatible with the alternator size shall be provided. Automatic-reset circuit breakers shall be used for directional lights, cab heater, battery power, ignition and other circuits. An access cover shall be provided for maintenance access to the electrical distribution area. _____

117.3 A 6-place, constantly hot, and 6-place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. _____

117.4 Radio suppression shall be sufficient to allow radio equipment operation without interference. _____

117.5 All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be colour coded and functionally labelled every three (3) inches on the outer surface of the insulation for ease of identification and maintenance. _____

117.6 The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment

shall be weather resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion. _____

117.7 A Vehicle Data Computer (VDC) shall be supplied within the electrical system to process and distribute engine and transmission Electronic Control Module (ECM) information to chassis system gauges, the message centre, and related pump panel gauges. Communication between the VDC and chassis system gauges shall be through a 4-wire multiplexed communication system to ensure accurate engine and transmission data is provided at the cab dash and pump. The VDC shall be protected against corrosion, excessive heat, vibration, and physical damage. _____

117.8 Two (2) dual rectangular sealed beam halogen headlights shall be installed on the front of the cab, one (1) on each side, mounted in a polished chrome-plated bezel. The low beam headlights shall activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle visibility and safety. _____

117.9 The headlight switch shall automatically override the DRL for normal low beam/high beam operation. _____

117.10 Ground area lights shall be provided for each cab door and one (1) on each side under the front bumper area. Lights under the driver and crew area exits shall be activated automatically when the exit doors are opened. Ground area lights shall be switched from the cab dash with the work light switch. _____

117.11 12 volt automotive style electrical supply system. _____

117.12 Batteries – quantity 4, 100 amp minimum, Group 31 type with 1000 cold cranking amps preferred or as recommended by the manufacturer considering load requirements and severe use. _____

117.13 Battery location – batteries shall be located in an enclosed battery tray within close proximity to the engine. The battery box shall by fully enclosed, vented and corrosion resistant. The bottom of the battery box shall be dry deck lined. The batteries shall be protected from road spray and located under cab. Within cab battery access preferred. State. _____

117.14 Battery cables – as recommended by the manufacturer for severe use. _____

117.15 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. _____

117.16 Charging system plug-in – automatic ejector type with a 20 amp receptacle mounted on the rear of the apparatus body on the left side, 60 to 80 inches above ground level. _____

117.17 Ground wire – the electrical wiring harness should have a dedicated ground wire running the full length of the truck. Weather tight junction boxes should be provided at the dash, pump panel and the rear of the truck. This ground wire should be connected directly to the battery negative post. All electrical systems should be grounded to this ground wire. The conventional grounding system using the frame shall be

maintained.

117.18 Alternator – Niehoff 265 amp, per NFPA 1901 rating minimum with compatible drive system for full load capacity. The alternator shall be shielded from exhaust and engine heat where required. The alternator shall be sufficient to exceed the electrical demands of the vehicle under full load.

117.19 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.

_____

_____

_____

_____

118.0 FUEL SYSTEM

118.1 Fuel tank – minimum 40 imperial gallons (182 L) capacity. State.

118.2 Fuel pump- mechanical type, or as recommended by the manufacturer.

119.0 EXHAUST SYSTEM

119.1 Horizontal muffler and exhaust, aluminized or stainless steel preferred. State.

119.2 Tailpipe – preferred location on the right side of the apparatus, suitable for

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

120.0 TRANSMISSION

120.1 Allison World transmission model HD EVS45OOP, electronic 5 speed automatic.

120.2 Torque converter –as recommended by the manufacturer .

120.3 Direct drive lockup for pumping operation.

120.4 Shifter – a push button shift module Allison model # 29538373 preferred or as recommended by the manufacturer. State.

120.5 Shifter shall be located to the right of the steering column within easy reach of the driver

120.6 Shift position indicator shall be backlit. _____

120.7 Shift module shall have a “Do Not Shift” light and a “Service” indicator light. _____

120.8 Shift module shall have a diagnostic mode and display diagnostic data. _____

120.9 Transmission temperature gauge and warning light and audible alarm shall be supplied and installed on the cab instrument panel. _____

120.10 Transmission oil filter – as recommended by the manufacturer. _____

120.11 Drain plug – magnetic type. _____

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

120.13 PTO opening – required. _____

120.14 Output retarder – preferred, brake pedal activated. State. _____

121.0 DRIVE SHAFTS

121.1 Spicer 1810 Series drive shafts preferred. State. _____

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

122.0 AXLES AND SUSPENSIONS

122.1 Front axle – minimum 10% greater than the actual vehicle weight being carried or as recommended by the manufacturer. State. _____

122.2 Front suspension –to match the front GAWR. _____

- state make and model being bid _____

122.3 Cramp angle- shall have a nominal cramp angle of 45^{o} (degrees). _____

122.4 Shock absorbers, front – heavy duty, double acting preferred. State. _____

122.5 Rear axles- minimum 10% greater than the actual vehicle weight being carried or as recommended by the manufacturer. State. _____

122.6 Drive ratio – should be geared so as the engine RPM will be at maximum at approximately 62 MPH (100 km/h). _____

122.7 Differential drain plugs – magnetic type, or as recommended by the manufacturer. _____

122.8 Rear Suspension – Rubber Block (Dynalastic) or spring suspension or as recommended by the manufacturer. State. _____

-State make and model being bid. _____

122.9 Air Ride Suspension- Raydan system required for tandem drive axles with walking beam suspension if spring suspension supplied. _____

122.10 Height control valves shall be provided for load balancing. _____

123.0 WHEELS AND TIRES

123.1 Front wheels – polished aluminum preferred or as recommended by OEM. Shall meet Tire and Rim Association requirements. State. _____

123.2 Front tires – as recommended by OEM. State. _____

123.3 Rear wheels – polished aluminum preferred or as recommended by OEM. _____

123.4 Rear tires – as recommended by OEM. State make and model. _____

123.6 Spare wheel & tire - (1) wheel and tire assembly to match front, _____
- (1) wheel and tire assembly to match rear _____

Note: Spare wheels & tires to be shipped loose. _____

124.0 BRAKE SYSTEM

124.1 Full air service brake system. The system shall meet or exceed the design and performance requirements of the current FMVSS-121 and test requirements of the current NFPA 1901 standard. _____

124.2 Antilock braking system required. Shall provide antilock brake control on all wheels and traction control on both axles. State make. _____

124.3 Brakes, vented disc front and drum rear preferred, or as recommended by the manufacturer. _____

124.4 Slack adjusters – automatic type. State make and model. _____

124.5 Emergency/Parking brake – spring set parking brakes on rear service brake system. System shall provide automatic spring brake application at 40 psi. _____

124.6 Air lines – colour-coded, reinforced nylon tubing. _____

124.7 Air compressor – as recommended by manufacturer. _____

124.8 Air dryer – required, as recommended by manufacturer. State make and model. _____

124.9 Moisture ejector – Bendix DV-2 or equal, heated, automatic, preferred, in wet tank only. _____

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

124.11 Air tank reservoirs– one reservoir shall serve as a wet tank and a minimum of (1) tank should be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121. Tank sizes shall be as recommended by the manufacturer. _____

124.12 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 should be a 3/8 inch (9.5 mm) NPT male fitting, capped, and should be located on the left side of the chassis cab. State. _____

124.13 Air line sources – all air lines should be sourced after the air dryer. _____

124.14 110 volt air compressor – 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 should be provided through the charging system plug-in (see 117.16). State. _____

125.0 STEERING

125.1 Hydraulic power steering. _____

125.2 Steering column – tilt and telescopic type. _____

125.3 Steering wheel – padded type. _____

126.0 FRAME

126.1 Steel channel rail frame designed and constructed to match the GVWR and the application of the vehicle as a fire apparatus, c/w a full lifetime warranty against defects in materials or workmanship supplied by the apparatus manufacturer. _____

126.2 Resisting bending moment – as recommended by the manufacturer. State. _____

126.3 Front frame extension – bolt on as required for 145.4, preferred. State. _____

126.4 Trash hose storage compartment – approximately 21inch x 12 inch x 12 inch deep, to accommodate 50 feet of 1 3/4 inch hose with nozzle, c/w aluminum cover, located in front bumper extension. Preferred. State. _____

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

126.6 Corner indicators – blaze orange, flexible sight rods, approx. 24 inches high. _____

126.7 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). _____

126.8 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. _____

127.0 CAB AND CAB EQUIPMENT

127.1 Four-door, fully enclosed, low entry, tilt cab over design, five (5) person minimum crew cab with forward facing seating preferred. _____

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

127.2 Construction – corrosion resistant aluminum required. State. _____

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

127.4 Cab interior –The cab interior height should be sufficient for an average firefighter to enter or exit and to sit erect with full turnout gear, including helmet and a cab width of approximately 87 inches minimum preferred. Tinted glass windows shall be located in the front and sides of the cab as permitted by the highway traffic act. Cab exterior length approximately 130 inches. Cab exterior width approximately 94 inches wide. State. _____

127.5 Entrance doors – two (2) per side. _____

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

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

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

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

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

127.11 Door hinges – as recommended by manufacturer. State. _____

127.12 Weather stripping – automotive style. Preferred. State _____

127.13 Entry assist handles – grab handles as per NFPA standard. _____

127.14 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 inches (559 mm) above ground level. Step should be a minimum 22 inches wide. The step surfaces shall be non slip material and should be nominal 10 inches deep to ensure a safe stepping area for firefighter in turnout boots. State. _____

127.15 Rear entrance steps – should be designed to allow personnel to step out of the cab in a forward position. Step surfaces preferred should be a nominal 10 inches deep to ensure a safe stepping area for firefighter in turnout boots. The location of the rear entrance steps should 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. State. _____

127.16 Step area lights – recessed, side mounted light in each entrance step area. The lights shall be activated preferably by door switches. State. _____

127.17 Seats – five (5) seats preferred as follows. All seats should be Seats Inc. Model 911 with grey, heavy duty vinyl upholstery. _____

127.18 Drivers seat – conventional high-back, fully adjustable air suspension seat upholstered in grey Mordura or equivalent. State. _____

127.19 Officer's seat – fully adjustable air suspension seat preferred with a Zico walkaway SCBA bracket. _____

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

127.21 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, 3-point mount, collision restraint straps, c/w removable backrest centre piece. State. _____

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

127.22 Seat belts – three-point, retractable type for all seats, with the exception of the rear middle seat which may be equipped with a two-point retractable type seat belt. _____

127.23 Floor covering – heavy duty, slip resistant rubber, in accordance with NFPA 1901. _____

127.24 Insulation – full insulation with an interior (dbA) rating as per NFPA 1901c/w vinyl padding package for walls and ceiling. Insulation should be non-hygroscopic, mildew proof and fire retardant. Vinyl should be grey, heavy duty automotive type is preferable. State. _____

127.25 Floor insulation – as recommended by the manufacturer. State. _____

127.26 Headliner – grey, heavy duty vinyl with padding preferred. State. _____

127.27 Windows – tinted safety sunglass for all windows including windshield. _____

127.28 Door windows, front – fully opening roll-up windows. _____

127.29 Door windows, rear – fully opening roll-up windows. _____

127.30 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 127.33) _____

127.31 Sunvisors – 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 fills in the gap that is found between the two outer visors. _____

127.32 Mirrors, exterior – west coast style chrome finish or stainless steel mirrors c/w convex mirror built into the mirror head, electric defroster. Driver operable remote controls are preferred. _____

127.33 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 drivers and officers foot area to ensure occupant comfort when heat is required. In dash defroster outlets shall be provided to defrost entire windshield and the drivers and officers side windows. Coolant flow in the heater circuit shall be passively controlled by a dash mounted heat control device,

(preferred). 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, -35° C, to +35°C. State. _____

127.34 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. _____

127.35 Dome lights – 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. _____

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

127.37 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 hourmeter. _____

k) Air cleaner restriction indicator gauge if recommended. _____

l) Engine oil filter bypass indicator lights if recommended. _____

m) Fuel filter bypass indicator lights if recommended. _____

n) Transmission filter bypass indicator lights if recommended. _____

127.38 Dashboard gauges shall be calibrated in Metric Units. _____

127.39 Ignition switch – keyless type preferred. State. _____

127.40 Doors- shall be keyed alike. _____

127.41 OEM Engine shut down system- operational with coolant, oil pressure,

transmission oil temperature. Shall be audible and c/w warning light. _____

127.42 Radio- should include a quality AM/FM stereo, mounted inside of dash, controlled by the driver. State make and model. _____

127.43 Battery jumper studs required on Officer's side to allow for jumps starting of the apparatus without lifting the cab. _____

127.44 Overhead console- full width required to house siren and radio heads and warning light switches. _____

128.0 CAB PAINT

128.1 The cab and chassis shall be painted with the highest quality finish for low maintenance, long life, and attractive appearance. The finish shall consist of a corrosion-prevention pre-treatment to all bare metal, a sealer/primer, two coats of base colour, and two coats of clear finish. _____

128.2 The aluminum cab and body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint. Any vertically or horizontally hinged smooth-plate compartment door shall be painted separately to assure proper paint coverage on the body, doorjambs, and door edges. _____

128.3 The paint process shall include Corrosion Prevention prior to paint. All raw materials shall be pre-treated with the Weather Jacket Corrosion Prevention system to provide superior corrosion resistance and excellent adhesion of the top coat. _____

128.4 Primers, paints and clear coats shall be as recommended by the manufacturer. _____

128.5 Any location where aluminum is penetrated after painting for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment. The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. _____

128.6 All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment. _____

128.7 The chassis frame and undercarriage components shall be finished painted black. _____

128.8 The vehicle wheels shall be painted to match the exterior colour of the colour of the vehicle unless otherwise specified. The vehicle wheels shall be trimmed in silver paint to complete the wheel finish. _____

128.9 If recommended by the manufacturer, Cathodic protection shall be supplied where dissimilar metals come into contact. _____

129.0 TWO-TONE CHASSIS PAINT

129.1 The two-tone chassis colour shall consist of white acrylic urethane paint applied to the upper section and red acrylic urethane paint applied to the lower section and red of the cab of the cab. The paint break line shall approximately one (1) inch below the window line. _____

129.2 The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment door shall be painted

separately to assure proper paint coverage on body, door jambs and door edges. _____

129.3 Any location where aluminum is penetrated, after painting, for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment. The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. _____

129.4 All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment. _____

130.0 DETAILING

130.1 Standard Model detailing shall be supplied as recommended by the Manufacturer to compliment the apparatus being offered. _____

131.0 LETTERING

131.1 15 inch Scotchlite tape letters **(WINNIPEG FIRE PARAMEDIC SERVICE)** shall be applied to the boom on both sides. _____

132.0 REFLECTIVE TAPE ON JACKS

132.1 The four outriggers that protrude beyond the side of the body shall be striped with white reflective tape. The tape shall be visible from the front or rear of the unit. _____

133.0 WARRANTIES

133.1 **Engine**

Shall have a minimum five (5) year, 100%, parts and labour warranty. _____

133.2 **Transmission**

Shall have a minimum five (5) year unlimited miles, parts and labour warranty. _____

133.3 **Axles/Suspensions**

Front axle shall have a minimum five (5) year/unlimited mileage parts and a three (3) year labour warranty. _____

133.4 **Anti-Locking Braking System (ABS)**

Shall have a (3) year/300,000 miles parts and labour ABS warranty. _____

133.4 **Paint**

The Apparatus Manufacturer shall provide a full 100%, 10-year paint warranty. This warranty shall cover the entire vehicle against peeling, cracking and blistering. _____

UV paint fade shall be covered in a separate warranty supplied by the Paint Manufacturer and shall be for a minimum of seven years. _____

The Apparatus Manufacturer shall supply a lifetime Vehicle Corrosion Perforation warranty. _____

133.2 **Frame**

The apparatus manufacturer shall provide a full lifetime frame warranty. This warranty

shall cover all apparatus manufacturer designed frame, frame members, and crossmembers against defects in materials or workmanship for the lifetime of the covered apparatus. Frame warranties that do not cover crossmembers for the life of the vehicle shall not be acceptable.

133.3 **Structural Warranty**

The apparatus manufacturer shall provide a comprehensive 10-year/100,000-mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided within forty eight (48) hours of a request by the Contract Administrator..

Note: Complete copies of **all** warranties must be submitted by manufacturer within forty eight (48) hours of a request by the Contract Administrator.

134.0 TRAINING

134.1 The Contractor shall be required to provide training by qualified staff, for up to three (3) City of Winnipeg personnel. The training shall be conducted at the manufacturer's plant. All costs associated with the training (ie)- air fare (to and from), accommodations, shall be at the Contractor's expense. The training session shall be sufficient in duration and shall provide adequate familiarization and orientation of the equipment, to the satisfaction of the Contract Administrator. All particulars surrounding the specified time required to perform the training shall be provided to the Contract Administrator by the Contractor eight (8) weeks prior to the delivery of the completed equipment. The training shall be coordinated through the Contract Administrator.

134.2 State if VHS video tape training aides on the type of equipment being offered are available.

135.0 MANUALS

135.1 Two (2) copies of all operator, service, and parts manuals shall be supplied at the time of delivery in electronic format (CD-ROMs).

135.2 The electronic manuals shall include the following information:

Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, installed components, and auxiliary systems.

Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and fire fighting systems.

Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.

Instructions regarding the frequency and procedure for recommended maintenance.

Maintenance instructions for the repair and replacement of installed components.

Parts listing with descriptions and illustrations for identification.

Warranty descriptions and coverage.

The CD-ROM shall incorporate a navigation page with electronic links to the operators manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations. _____

The CD must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail memos. _____

A find feature shall be included to allow for searches by text or by part number. _____

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer's location. _____

Engine/Transmission Manuals

A separate engine overhaul, engine parts, transmission overhaul, and transmission parts manuals shall be supplied at the time of delivery in Electronic Format(CD-ROMs). _____

155.0 LITERATURE

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

QUESTIONNAIRE

1.0 **LIST** any significant features that will be supplied standard on the unit being offered, but were not specifically mentioned in the Detailed Specifications:

2.0 **LIST** three current users of the equipment being offered:

3.0 **STATE** the location of the service facility: (See D10.2).

4.0 **DOES** the equipment being offered meet or exceed the minimum requirements of the Detailed Specifications?

5.0 **LIST** any deviations that might be considered less than equal to the Detailed Specifications: