FORM N(R1): DETAILED SPECIFICATIONS 23029

FIRE HEAVY RESCUE APPARATUS

1. INSTRUCTIONS FOR COMPLETION OF SPECIFICATIONS

1.1 All items in these specifications should be answered indicating compliance or non-compliance.

1.2 **Bidder/Proponents shall state "yes" for compliance or state "deviation"**, or give a reply where requested to do so. Deviations and/or equivalents shall be clearly stated and fully detailed. Deviations and/or equivalents will be considered subject to evaluation. In every instance where a brand name or design specifications is used, the City will also consider deviations and/or equivalents.

1.3 Lengthy explanations of deviations may be included in a separate document and must reference the appropriate Detailed Specification.

1.4 Each Bidder/Proponent is required to fill in every blank. Failure to do so may be used as a basis for rejection of bid/proposal.

1.5 It will be the responsibility of the Bidder/Proponent to inform the City of any errors or omissions in these Detailed Specifications, for under this Contract, the Contractor shall be held responsible to ensure that the manufacturer will be responsible for the design, performance, reliability and satisfactory operational function of the unit.

2. DESCRIPTION OF EQUIPMENT

2.1 These specifications describe a **Fire Heavy Rescue Apparatus** and other equipment and features as specified herein.

2.2 The **Fire Heavy Rescue Apparatus** shall be a new 2024 model year or newer.

2.3 The **Fire Heavy Rescue Apparatus** and all other items/components shall be the manufacturer's latest model. The equipment shall be furnished complete and ready for operation. Any parts or accessories not specifically mentioned, but which are required to complete and place the equipment and associated attachments in successful operation shall be furnished as though specifically mentioned in these specifications. The equipment and associated attachments, and all parts thereof, shall conform in strength and quality of material and workmanship, to the best standards and engineering practice of the industry.

2.4 The **Fire Heavy Rescue Apparatus** shall be the manufacturer's latest model, as may be modified by these specifications. The **Fire Heavy Rescue Apparatus**, including all auxiliary equipment, shall be furnished complete and ready for use. All parts not specifically mentioned but which are required for the complete unit shall conform in strength, quality of material and workmanship, to the best standards and engineering practice in the industry.

2.5 The ratings specified herein merely state the minimum values acceptable to the City, not implying that those values are sufficient for the design of the particular equipment being bid/Proposed.

3. OTHER SPECIFICATIONS AND STANDARDS

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

3.2 The **Fire Heavy Rescue Apparatus** shall comply with the applicable regulations:

Transport Canada, National Safety Mark, NSM: http://www.tc.gc.ca/eng/acts-regulations/acts-road.htm

Manitoba Safety and Health Regulation, Parts 12, 16, 22: http://web2.gov.mb.ca/laws/regs/current/217.06.pdf

Canadian Motor Vehicle Safety Standards C.M.V.S.S. http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1038/section-sched3.html

Manitoba Highway Traffic Act regulations and requirements including, but not limited to, a Manitoba Government Inspection with Safety Sticker. http://web2.gov.mb.ca/laws/regs/index.php?act=h60

Canadian Standards Association, CSA: http://www.csagroup.org/

Under Writers of Canada, U/L: http://www.ulc.ca/

Society of Automotive Engineers, SAE: http://www.sae.org/

City of Winnipeg Lighting Visibility Standard: http://winnipeg.ca/matmgt/pdfs/PublicWorksEquipLightingVisibility.pdf

Manitoba Building Code: https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=31/2011

3.3 All welding and welding designs of the load supporting elements shall conform to the requirements of the Canadian Standards Association Standard (CSA) W47.1-03 and W59-03.

3.4 The completed unit shall include a Manitoba Government Inspection with Safety Sticker on the driver's side window.

3.5 The completed vehicle shall be complete with a National Safety Mark, NSM.

3.6 State NSM Number: _____

3.7 It will be the responsibility of the Bidder to inform the City of any deficiencies in these specifications, for under this Contract the Contractor shall be held responsible for the design, performance, reliability and satisfactory operational function of the units.

4.0 SERVICE FACILITY

4.1 For the purpose of warranty repairs, the Bidder shall have an authorized service facility located within 10 km of the boundaries of the City of Winnipeg. The facility, or a portion thereof, shall be dedicated to the service and maintenance of the type equipment being offered. Further to 9.1, Bidders shall provide a description of the service facility including, but not limited to, number of qualified service staff, years of service experience, and general service capabilities within three (3) Business Days upon request of the Contract Administrator. The Winnipeg Fire Department's Emergency Mechanical Services Branch shall be an authorized warranty repair facility. The emergency mechanical services branch shall have the ability to do authorized warranty repair work and provide an invoice to bill back parts and labour to the bidder

5.0 REFERENCES

5.1 Provide five (5) references where this equipment is used in a working environment where climatic conditions are similar to the City of Winnipeg.

_____

_____

_____

_____

_____

6.0 MAKE & MODEL

6.1 **State** make, year and model of the equipment bid: _____

7.0 INSTRUCTIONS FOR COMPLETION OF SPECIFICATIONS

7.1 Each bid will be evaluated based on adherence to all terms, conditions and requirements outlined in the Bid Opportunity package.

7.2 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 and/or equivalents shall be clearly stated and fully detailed. Deviations and/or equivalents will be considered subject to evaluation. In every instance where a brand name or design specification is used, the City will also consider deviations and/or equivalents.

7.3 **EACH BIDDER IS REQUIRED TO FILL IN EVERY BLANK. FAILURE TO DO SO MAY BE USED AS A BASIS FOR REJECTION OF BID.**

8.0 PERFORMANCE RELIABILITY

8.1 The responsibility for the design of the **Heavy Rescue Apparatus**, its performance and reliability shall rest upon the Contractor.

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

8.3 Where the **Heavy Rescue Apparatus** develops “repeated failures” in service, the Contractor shall make any necessary engineering changes, repairs, alterations or modifications in order to guarantee reliability of performance.

8.4 The equipment shall be capable of consistent top performance in City of Winnipeg Environment. Note: The City of Winnipeg has four seasons with ambient temperatures ranging from approximately 90°F (32°C) to -40°F (-40°C).

9.0 FUEL

9.1 Where applicable, all equipment must be full of fuel upon delivery **(no exceptions).**

10.0 QUALIFICATIONS OF MANUFACTURER & CONTRACTOR

10.1 The manufacturer of the **Heavy Rescue Apparatus** shall have five (5) years continuous experience manufacturing the equipment.

10.2 The manufacturer shall have in effect a documented quality control program ensuring that the quality of materials and workmanship, including welding, conforms to the best standards and engineering practice of the industry.

10.3 The Contractor shall have five (5) years continuous experience servicing, repairing and maintaining **Heavy Rescue Apparatus** of the type being offered.

11.0 CHASSIS SPECIFICATIONS

GVWR, DIMENSIONS, WEIGHT DISTRIBUTION & TURNING RADIUS

11.1 Weights:

The Truck shall not exceed the City of Winnipeg’s limit for gross vehicle weight, axle and tire loads

Note: The City of Winnipeg and the Province of Manitoba limits the gross vehicle weight and axle and tire loads to:

- Front axle (steering axle) – 7300 kg (16,094 lbs.)
- Rear axle (single axle) – 9100 kg (20,062 lbs.)
- Tire load – 9 kilograms for each millimeter width of tire (approximately 500 lbs. per inch of tire width).

_____

11.2 **Weigh Scale Ticket:**
The Contractor shall provide a certified weigh scale ticket upon delivery of the completed unit. The scale ticket shall include front and rear axle weights including five (5) operators, full of water, foam all equipment as specified in this tender and full of fuel. _____

11.3 **Weight distribution:**
State weight distribution with water and foam and all associated tools and equipment. _____
Front: _____

Rear: _____

11.4 **Center of gravity:**
The vehicles shall meet all safety standards in relation to center of gravity. _____

11.5 **GVWR**
Gross vehicle weight rating (GVWR), **state.** _____

11.6 **Front (GAWR)**
Gross axle weight rating front (GAWR), approx. 21,000lbs. shall be a 10% greater than actual vehicle weight carried on front axle, **state.** _____

11.7 **Rear (GAWR)**
Gross axle weight rating rear (GAWR), approx. 27,000lbs. shall be 10% greater than actual vehicle weight carried on rear axle, **state.** _____

11.8 **Tare weight**
State the tare weight of the apparatus being bid:

Front: _____
Rear: _____
Total: _____

11.9 **Dimensions**
State the following dimensions: (***Note: No part of the vehicle, including lights, shall exceed the overall height specified.***

a) **Overall width** – Shall not exceed 102 in. _____

b) **Overall height** – Shall not exceed 132 in. _____

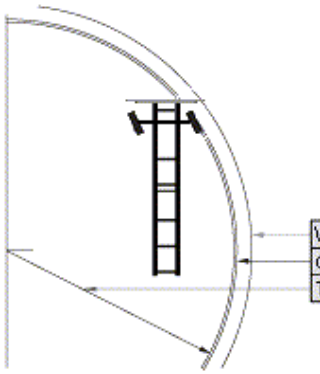
c) **Overall length** – Shall not exceed 38 ft. _____

d) **Wheelbase** – **State.** _____

e) **Ground clearance** – Shall not be less than 8 in. _____

f) **Turning Radius**- **State** turning radius- See example: _____

11.10 **Turning Radius- State** the vehicle turning radius, wall to wall. Curb to Curb.
Example:



	Left Turn	Right Turn	Tolerance
Wall to Wall Diameter (ft)	130.9	111.4	+/- 3.0
Curb to Curb Diameter (ft)	127.2	106.9	+/- 3.0
Turning Radius (ft)	62.9	52.7	+/- 1.5

a) **Wall to Wall (ft.)** _____
b) **Curb to Curb(ft.)** _____
c) **Turning Radius (ft.)** _____

ENGINE _____

11.11	Type	Six-cylinder Cummins diesel equivalent with integrated exhaust brake. Must meet current EPA Standards. Cummins diesel Tier IV Final - Emergency Service Vehicle) rated.	_____
11.12	Engine location	Over front axle.	_____
11.13	Horsepower	Approximately 400-500 HP gross.	_____
11.14	Torque	Approximately 1250-1800 lbs-ft.	_____
11.15	Engine governor	Electronic, compatible with fire pumper operation.	_____
11.16	Oil drain plug	Magnetic type.	_____
11.17	Oil filter	As recommended by the engine manufacturer, full flow, spin-on filter.	_____
11.18	Fuel filter/primary	Recommended by the engine manufacturer, spin-on filter, remote mounted on the chassis frame such that it is easily accessible for servicing. **Filter not to have plastic lower bowl.**	_____
11.19	Fuel filter/secondary	(If recommended) spin-on filter. The filter shall be remote mounted on the chassis frame, easily accessible for servicing.	_____
11.20	Starter	12-volt electric. The starter shall be shielded from exhaust heat where required.	_____
11.21	Air cleaner	Heavy-duty replaceable element, dry type, as recommended by the engine manufacturer.	_____

ENGINE COOLING SYSTEM

11.22	Engine cooling	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 95F (35C) to -45F (-

		43C). 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 normal operating temperature of the coolant system shall be approximately 180F (92C).	_____
11.23	Radiator	Pressurized type with surge tank or coolant recovery system.	_____
11.24	Fan drive	Thermostatically controlled fan clutch, viscous type or air clutch.	_____
11.25	Coolant	**Extended Life** coolant, antifreeze to -35°F (-37°C).	_____
11.26	Coolant filter	Spin on type, as recommended by manufacturer.	_____
11.27	Coolant hoses	Green line heavy-duty heater hose P#G6304-063	_____
11.28	Hose clamps	Spring loaded constant torque type.	_____
	ELECTRICAL SYSTEM		_____
11.29	Electrical supply	Multiplex Electrical System, Cold Cranking Amp Heavy Duty Batteries, Battery Charging System, Ground Wire, and Heavy-Duty Alternator with thermal protection and over crank protection**.**	_____
11.30	Batteries	Four (4) batteries, 12-volt, group 31, approximately 2700-2850 CCA.	_____
11.31	Battery location	Galvanized battery housing **state** location.	_____
11.32	Battery cables	4/0-gauge, colour coded welding type cable, with connector ends crimped, pull tested and sealed with heat shrink tubing at all connections. Positive battery cables must be secured individually to the frame and isolated from shorting to ground.	_____
11.33	Battery charging system	Kushmaul Auto Eject Pump Plus onboard battery charger and air brake compressor.	_____
11.34	Charging system plugin	Located between driver's door and the rear passenger door. Automatic ejector type with a 20 Amp receptacle. Located approx. 60 to 80 in. (1524 – 2032 mm) above ground level. Charger plugin shall not be located in the front step footwell.	_____
11.35	Ground wire	The electrical wiring harness shall have a dedicated ground wire running the full length of the truck. Weather tight junction boxes shall be provided at the dash, pump panel and the rear of the truck. This ground wire shall be connected directly to the battery negative post. All electrical systems shall be grounded to this ground wire. The total resistance of this ground wire shall not exceed 0.2 Volts drop at any point with all circuits turned	

		on. The conventional grounding system using the frame shall be maintained. Ground wires must be secured to the frame rail.	_____
11.36	Alternator	320 Amp or greater Leece Neville alternator	_____
11.37	Battery disconnect	Power to all electrical systems shall be wired through a power disconnects 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	_____
	FUEL SYSTEM		
11.38	Fuel tank	Approx. 50 Imp. Gallons (227L) Capacity	_____
11.39	Fuel transfer pump	Pump is to be external to fuel tank, back flow checked and in line with fuel supply lined.	_____
	EXHAUST SYSTEM		
11.40	Horizontal muffler and exhaust	Aluminized or stainless steel.	_____
11.41	Tailpipe	Located on the right side of the apparatus, suitable for use with an exhaust extraction system. The tailpipe shall be 90 degree to the rub rail, shall extend ½ in. (13 mm) beyond the rub rail and shall be 3 in. (76 mm) below the rub rail. Hanger brackets shall be 18 in. (457 mm) from the rub rail. **Note: The tailpipe configuration is intended for use with a "Plymovent" automatic exhaust disconnection system and shall include the installation of the magnetic adapter.**	
		ENGINE EXHAUST ACCESSORIES The body manufacturer on the vehicle shall ship an exhaust temperature mitigation device loose for installation. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.	_____
11.42	Exhaust ~~**Diverter**~~	~~**An exhaust diverter valve shall be located in-line of exhaust tubing and controlled from driver's position to re-route exhaust discharge. Exhaust diverter valve shall be constructed from 14-gauge stainless steel material with air-actuated control.**~~ As a default, the exhaust shall always discharge to curbside just ahead of rear wheels, ~~**and when selected the exhaust shall discharge to a**~~	

		~~**vertical exhaust pipe, extending above the body height 12".**~~ The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the apparatus or equipment to excessive heating. Exhaust pipe discharge shall be directed away from any operator's position. Where parts of the exhaust system are exposed so that they are likely to cause injury to operating personnel, protective guards shall be provided.	_____
	TRANSMISSION		
11.43	Transmission	Transmission shall be an Allison EVS 4000 automatic transmission with integrated hydraulic transmission retarder for Fire and Emergency use and rated for the requested horsepower and torque.	_____
11.44	Torque converter	As recommended by the Manufacturer.	_____
11.45	Shifter	As recommended by the Manufacturer.	_____
11.46	Transmission filter	As recommended by the Manufacturer.	_____
11.47	Drain plug	Magnetic type.	_____
11.48	Oil level dipstick	Bayonet type with high- and low-level markings.	_____
11.49	PTO opening	For this application.	_____
	DRIVE SHAFTS		
11.50	Drive shaft	Drive shaft Spicer 1710 Series or equivalent, drive shafts with Glide-coat splines. Bidder to provide engine/transmission SCAN and OEM recommendations for best-suited match.	_____
11.51	Drive shaft clearance	Adequate clearance to allow for greasing of the drive shaft U-joints from underneath the vehicle.	_____
	AXLES AND SUSPENSION		
11.52	Front axle	21,000 lbs. capacity c/w oil lubricated wheel bearings.	_____
11.53	Front Suspension	Heavy duty independent front suspension (IFS) air ride or torsion bar shall be accepted	_____
11.54	Shock absorbers	Front, heavy duty, double acting.	_____

11.55	Rear axle	Meritor single speed axle, 24-27,000 lbs. capacity. Heavy-duty differential housing.	_____
11.56	Drive ratio	Capable of achieving 105 km/hr (65 mph).	_____
11.57	Differential drain plugs	Magnetic type.	_____
11.58	Differential vent	Remote vent. Vent to c/w 10-micron breathable filter, water/dust cap and check value.	_____
11.59	Rear suspension	Hendrickson firemaax air ride suspension with capacity to best match GAWR to come with levelling valve for each spring.	_____

WHEELS AND TIRES

11.60	Front wheels	**Alcoa Standard polished**, 10 bolt.	_____
11.61	Front tires	Michelin, 385/65R 22.5	_____
11.62	Rear wheels	**Alcoa Standard polished**, 10 bolt.	_____
11.63	Rear tires	Michelin 12R22.5 16PR, XDN2	_____
11.64	Spare wheel & tire	One (1) wheel and tire to match front wheel and tire. Spare wheel & tire to be shipped loose.	_____

BRAKE SYSTEM

11.65	Brake system	Full air service brake system with spring loaded parking brakes and an anti-lock system.	_____
11.66	Antilock braking system	Comes with roll stability control, Meritor/Wabco four channel systems, providing independent antilock braking control at four wheels and traction control at rear drive wheels.	_____
11.67	Disc brakes (front)	Front disc brakes.	_____
11.68	Drum brakes (rear)	Meritor outbound drum brakes rear.	_____
11.69	Slack adjusters	Meritor automatic type.	_____
11.70	Parking brakes	Spring set parking brake on rear service brake system.	_____
11.71	Air lines	Colour-coded, reinforced nylon tubing.	_____
	Air compressor	Water-cooled, pressure-lubricated compressor, approx. 18CFM capacity. The compressor air intake shall be plumbed into the engine air intake after the air cleaner.	_____
11.72	Air dryer	Heated, spin-on desiccant type.	_____
11.73	Moisture ejector	Heated, automatic, in wet tank only.	_____
11.74	Drain valves	Cable operated manual drain valve P3WA12105, in each air tank except the wet tank. The cables shall	

		be vinyl coated and shall terminate at the bottom at the bottom edge of the cab or at the rub rail on the body.	_____
11.75	Auxiliary air reservoir	Nominal 1200 in^3 (20 L) air reservoir to operate the vehicle air horns and to function as an emergency parking brake release. A dash-mounted control, located directly below the main parking brake release, shall allow the air in the reservoir to be used to release the parking brakes. The control shall be non-detented, spring return type such that it cannot be left engaged in the brake release position. There shall be an extra isolated air tank that will be used to run the vehicle rescue tools. There shall be a second auxiliary air tank that is directly connected to the air primer system.	_____
11.76	External air inlet	Milton A style air fitting installed on left side of chassis so the WFD can plug their shop air lines into the truck. Shall be plumbed to the outlet side of the air dryer for the option to put alcohol into the air system without going through the dryer.	_____
11.77	Airline sources	All air lines shall be sourced after the air dryer.	_____
11.78	Auxiliary pump	Kushmaul auto pump plus.	_____
11.79	Park Brake Valve Location	Park brake valve shall be located as close to the driver as possible. This item shall be discussed at the prebuild meeting.	_____
	STEERING		
11.80	Power steering	Hydraulic power steering with oil cooler, tilt and telescopic style, rated for front GVWR rating.	_____
11.81	Steering wheel	2 spoke. Padded style.	_____
	FRAME		
11.82	Galvanized frame and components	Galvanized steel frame rail(s) designed and constructed to match the GVWR and application of the vehicle as a triple combination fire pumper apparatus. The frame shall be hot dip galvanized prior to assembly and attachment of any components. Single or double frame rails shall be accepted. OEM to provide engineering document that supports choice of single vs double frame. The components that shall be galvanized shall include: Main frame “C” channel or channels Front splayed rails and fish plates Cross members (excluding suspension cross members) Cross member gussets	

		Fuel tank mounting brackets Fuel tank straps Air tank mounting brackets Exhaust mounting brackets Air cleaner skid plate Radiator skid plate Battery supports, battery trays and battery covers	_____
11.83	RBM	Resisting bending moment combined for both frame rails 3,200,000 in-lbs. RBM shall be rated for GVWR request, application and intended use.	_____
11.84	Front frame extension	Bolt on as required for front bumper stated herein.	_____
11.85	Front bumper	Heavy-duty front bumper, the front bumper shall be painted black bumper bolted to the chassis frame. Bumper apron to be 3/16" –anti-slip. The front bumper shall have 45-degree angled corners. The front bumper shall have a full length and width compartment with one single lid. This compartment shall be divided into three separate areas. The center section shall be for the winch and the two outside storage areas shall be for rescue equipment and tools. This storage shall be able to hold a min 500lbs. The front face of the bumper shall have a chevron decal. There shall be a hole on the right side of the front bumper to store traffic cones. There shall be a mounting strap to secure traffic cones	_____
11.86	Front tow hooks	Frame shall have forward "forks" to which the eyehooks are affixed.	_____
11.87	Rear tow hooks	Two (2) eyehooks, bolted to the chassis frame. A cross-member shall be located in the chassis frame at the tow hook location. The tow hooks shall be easily accessible.	
	Technical Rescue Anchor Points	There shall be six (6) Technical Rescue Life Safety Anchors rated for life safety. 2 front, 2 rear and one on each side of the apparatus (not used for towing). It is preferred that these anchor points be located inside compartments.	_____

CAB AND CAB EQUIPMENT

11.88	Custom cab	a) This apparatus shall fully incorporate a clean cab concept. The clean cab shall allow for easy decontamination. The cab interior shall be of a light color to show dirty easily. There shall be anti-slip seamless cab floor to allow for easy decontamination and washing. There shall be no firefighting equipment stored in the cab. The details of the clean cab shall be discussed at the preproduction meeting.	_____

b) The cab shall be a custom, fully enclosed, with a raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to five (5) seating positions. _____

c) The cab shall have two SCBA seats located on the rear wall that face forward. These two seats shall be positioned in the middle of the rear wall to allow for a clear forward view of the fire scene. There shall be a third seat that is offset to one side that functions as a jump seat and has a flip up seat bottom. There shall be enough space between the three forward facing rear seats to allow crew personnel to be seated comfortably. _____

d) There shall be an exterior medical compartment on both side of the cab located between the front and rear doors. These compartments shall be heated and have roll up doors. These compartments shall have one adjustable shelf. There shall be storage space above the medical compartments. There shall be cargo netting to secure the items stored above the medical compartments. _____

11.89 Cab design

The cab shall incorporate a fully enclosed design with sidewall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial
adhesives designed specifically for aluminum fabrication for construction.

Cab tilt system shall allow for electric over hydraulic tilting of the cab with a permanently mounted rocker switch mounted in the right-side compartment. Cab tilt system shall include a hydraulically operated manual cab tilt option in the event the pump fails

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate,

		which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.	_____
11.90	Cab construction	The cab shall be constructed of corrosion resistant aluminum plate. The cab shall be constructed from minimum of 3/16" 6061-T6 or 6063-T6. Aluminum extrusions for extreme duty situations. The cab and sub structure shall create an occupant compartment that will create a roll over protection system. The cab shall meet or exceed NFPA 1901 standards. The cab shall be fully crash test rated.	_____
11.91	Cold weather insulation	Extreme climate full insulation under cab, roof, ceiling, firewall, and walls and vinyl padding package for walls and ceiling. Insulation shall be non-hygroscopic, mildew proof and fire retardant. Vinyl shall be grey, heavy-duty automotive type. Also, as required to meet HVAC needs and acceptable sound suppression requirements.	_____
11.92	Interior and exterior seams	All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favourable efficiency for heating and cooling retention.	_____
11.93	Exterior width & Length	The exterior width of the cab shall be 94.00 inches wide with an interior width of 88.00 inches. The cab shall be an extended length cab to allow the specialty rescue groups more area to don specialty gear.	_____
11.94	Cab interior design	The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.	_____
11.95	Cab interior height	The cab shall offer an interior height of 57.25 inches from the front floor to the headliner and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 55.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.	_____
11.96	Cab doors	The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel	

		in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening. The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.	_____
11.97	First step area (Driver and Officer)	The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.50 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 33.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.	_____
11.98	First step area (Crew)	The first step for the crew area shall measure approximately 11.50 inches deep X 21.50 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.50 inches wide. The height from the first step to the Intermediate step and the intermediate step to the cab floor shall not exceed 12.50 inches.	
		The front grill on the apparatus shall have a large Canadian flag painted on it. It would be preferred if the front grill tilted down to allow for remote access to check the engine and transmission fluid levels.	_____
	Note: Bidders shall supply a drawing showing the cab interior layout and relevant dimensions.		_____
11.99	Insulating material	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.	_____
11.100	Door handles/latches exterior	As recommended by manufacturer.	_____
11.101	Door handles/latches interior	Flush-mounted, paddle handle type, located such as to prevent accidental actuation.	_____
11.102	Door latch striker plates	Recessed such as not to protrude into the door opening area.	_____
11.103	Door hinges	As recommended by manufacturer.	_____
11.104	Weather stripping	Automotive style.	_____
11.105	Grab handles	Grab handles as per NFPA standard. Grab handles shall be of a one-piece design with hook to hang turn out gear coat.	_____
11.106	Step area lights	LED recessed, side mounted light in each entrance step area. The lights shall be activated by door	

		switches.	_____
11.107	Seats/seating layout	All seats shall be SCBA seats be manufactured by H.O. Bostrom or Emergency 911 with grey non-absorbent extreme duty vinyl. Three Front Facing seats on rear wall of cab	_____
11.108	Driver's seat	H.O. Bostrom or emergency 911 air seat 5" Fore/Aft Adjust and occupancy switch.	_____
11.109	Officer's seat	SCBA seat H.O. Bostrom or emergency 911 air seat with 5" Fore/Aft Adjust, and occupancy switch.	_____
11.110	Air seat supply	Air supply for the seats shall be taken from the auxiliary air reservoir.	_____
11.111	Rear seats	SCBA seat, Forward Facing Crew (2): HO. Bostrom or Emergency 911 seat and occupancy switch. One SCBA jump seat.	_____
11.112	Seat belts	Three-point, retractable type for all seats. Seat belts shall be designed to be long enough for large operators, and female Deutsch connections to extend so as to be easily accessible. The seat and seat belt sensor wiring connectors shall be Deutsch connectors.	_____
	Winter Front	Apparatus shall come with a custom fit removable winter front with adjustable openings to allow some air to go through if required.	_____
11.113	Occupant Protection System	The system shall include the following components:	
		a) Driver steering wheel airbag.	_____
		b) Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.	_____
		c) Large driver, officer, and crew area side curtain airbags.	_____
		d) Seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.	_____
		e) Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event.	_____
		f) Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a	

		qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM.	_____
		g) (SRS) light on the driver's instrument panel.	_____
		h) Fault-indicating Supplemental Restraint System	_____
11.114	Floor covering	Heavy-duty rubber anti-slip seamless floor-mat that is non-absorbent and works with the clean cab concept and will allow for easy decontamination. The floor covering shall extend 3" up the cab wall to assist with cleaning the cab.	_____
11.115	Headliner	Grey, heavy duty non-absorbent vinyl with padding	_____
11.116	Windows	Tinted safety glass for all windows including windshield. Apparatus shall be equipped with **manual crank** windows.	_____
11.117	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 drivers switch panel.	_____
11.118	Sun visors	Two (2) swivel visors. One positioned each in the front of the driver and officer. These visors swivel to provide coverage of the front door windows.	_____
11.119	Mirrors exterior	The cab exterior shall include bus style mirrors, one (1) mounted on the drivers' door and one (1) mounted on the right front cab corner radius below the windshield. Flat and convex mirrors heated and remote controlled located within easy reach of the driver.	_____
		Left side mirror head, injection moulded chrome plated ABS plastic that measures approx. 9.50 inches wide X 17.50 inches high and is mounted with a polished die-cast aluminum arm.	_____
		Right side mirror, injection moulded chrome plated ABS plastic that measures approx. 9.50 inches wide X 17.50 inches high and is mounted with a 19.00-inch-long polished cast aluminum arm.	_____
11.120	Front/Rear heater and air conditioner	Heating/Ventilating/Air Conditioning System (HVAC) The HVAC shall be a high output, fresh air type with multi-speed fan, controlled by the driver. There shall be a HEPA filtration system capable of stripping the outside air of pollen, bacteria, and pollution before they enter the cabin and systematically scrubbing the air inside the cabin to eliminate any trace of these particles air. Outlets	

		shall be provided at dashboard level and in the driver and officer's foot area to ensure occupant comfort when heat is required. Defroster outlets shall be provided to defrost entire windshield and the drivers and officers side windows. Coolant flow (preferred) in the heater circuit shall be passively controlled by a dash mounted heat control device. The system/s shall meet or exceed the BTU's required to heat/cool the cab for the temperatures common to the City of Winnipeg, i.e., 35°C, to -40°C.	_____
11.121	Rear heat/air conditioner~~/Aux. coolant heater~~	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.***	_____
11.122	Dome lights	Four (4) LED lights, two (2) in the front and two (2) in the rear portion of the cab to fully illuminate the cab interior. Dome lights shall be combination type with clear and red lenses. All lights shall be operated by door switches. Each light shall be equipped with an individual switch at the light.	_____
	Rear crew area interior work lights	There shall be four evenly spaced 8" Federal Signal Commander LED work lights. These four lights shall be wired to a manually operated rocker switch located in the rear crew area that is interlocked to only operate when the park brake is applied.	_____
11.123	Instrumentation	Full instrumentation on a removable or flip down panel, or pull-out gauges.	_____
11.124	Metric instrumentation	To include, but not limited to: • Speedometer/odometer: metric • Tachometer. • Oil pressure gauge. • Coolant temperature gauge. • Transmission oil temperature gauge or warning light. • Low oil pressure/high water temperature warning lights(s) • Voltmeter • Fuel level gauge • Air reservoir pressure gauge(s). • Engine hour meter. • Air cleaner restriction indicator gauge.	

		• Engine oil filter bypass indicator lights. • Fuel filter bypass indicator lights. • Transmission filter bypass indicator lights if recommended.	_____
11.125	Ignition switch and master power	Keyless ignition system with lockable master power switch.	_____
11.126	Doors	Heavy-duty construction with stainless steel inside door panels. Doors shall have a led light that flashes when the door is open.	_____
11.127	Warning system	OEM engine warning system.	_____
11.128	Radio	AM/FM stereo, mounted inside of dash, controlled by the driver.	_____
11.129	Mobile radio	12V power & ground located at center dash area **(To be prewired during manufacture as determined at pre-production meeting).**	_____
11.130	Lap top computer provision	12V power & ground at center dash area (purchaser to supply support bracket) **(To be prewired during manufacture as determined at pre-production meeting).**	_____
11.131	USB charging ports	Two (2) located at center dash area.	_____
11.132	Automatic Vehicle Immobilizer	The anti-theft system shall be automatically activated upon application of the apparatus park brake. There shall be a hidden momentary switch to disengage the anti-theft	_____
11.133	Cab door hardware	Hardware to be heavy duty in design and operator glove friendly.	_____
	APPARATUS BODY	**Note: Compartment configurations to be finalized at Pre-production meeting.**	
11.134	Type	Rescue style, heavy-duty style body, aluminum or 304Lstainless. If using aluminum bodies only extruded aluminum will be accepted. Shall be tongue and groove or interlocking of the components. ***Note: Aluminum or 304L stainless bodies on steel sub frame shall not be acceptable.*** The body compartment doors shall be roll up doors with pull down straps, there shall be a lower door that folds down or pulls out to a step/seating area. The fold down step shall include a positive lock. The fold down steps shall allow for easy access to the higher compartment shelves. Designs without the lower door/step shall de accepted.	_____ _____
11.135	Rub rail	Extruded aluminum rub rail, bolted in place and located along the lower edge of the body, both	

		sides nonconductive.	_____
11.136	Compartment floors	All compartment floors shall be 3/16 in. (5mm), with continuous welds.	_____
11.137	Insulating material	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.	_____
11.138	Drip mouldings	Located above all compartment door openings.	_____
11.139	Storage compartments	Located along each side and rear of the body and the storage compartments. Shall provide a combined interior volume. All compartments will have rollup doors unless otherwise indicated.	_____
11.140	Compartment design	All compartments shall have vents for ventilation that prevents condensation build up inside the compartments. All compartments shall have sweep-out style compartments. Bottom shelves to have provisions for water drainage.	_____
11.141	Compartment doors	Roll-up doors lock/lifting bars c/w door ajar warning circuit c/w magnetic sensor located near top of door. The door sensor shall have a fixed mounting bracket that is bolted to the compartment. (Sensors on door handles not acceptable) All compartment doors shall have anodized aluminum slats. The roll up door drum shall have a drip tray	_____
11.142	Warning circuit	“Door ajar” warning circuit to indicate an open storage compartment door with a nominal 2 in. (51 mm) diameter flashing red warning light located in the cab and shielded to protect from visibility from oncoming traffic. Compartment door ajar light sensors shall be bolted to the apparatus body. The multiplex system shall identify which door is open independently of the other doors on the multiplex screen.	_____
11.143	Compartment lights	LED lighting in each compartment to the right and left of opening, full length of opening. The opening of each compartment door shall activate the lights in each compartment.	_____
11.144	Shelves	All compartment shelves shall be 3/16 in. (5 mm) aluminum and shall cover the full width of the compartment. Shelves shall be lined with an Interlocking matting, dry-deck or equal.	_____
11.145	Slide-out trays	All slide-out trays shall be 3/16 in. (5 mm) aluminum with heavy-duty steel sliders, with ball bearing rollers capable of supporting a capacity of 500 lbs or greater. The slide-out trays shall have paddle-handle type latches with dual point locks or dual T-handle type latches. The trays shall lock in the open and closed positions. All slide out trays	

		shall be marked with chevron pattern decal.	_____
	Winch anchors	The completed unit shall have an integrated receiver system for use with a portable electric winch. There shall be four winch anchor points on the apparatus. One on the front and rear and one on each side of the apparatus. It is preferred that these receivers be located inside compartments. The receivers shall be isolated from outside weather conditions.	_____
	Compartment Descriptions		
11.146	Left side, front compartment (L1)	This compartment shall be shared with R1. This compartment shall store two backboards, one scoop stretcher and reeve sleeve and 6' and 8' pike poles. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
11.147	Left side, center compartment (L2)	This compartment shall be a pass through. This compartment shall have two (2) pull out trays and one lower adjustable shelf. The top pull out tray shall tilt. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
11.148	Left side, rear compartment (L3)	This compartment shall be a pass through. There shall be one (1) pull out tilting tray on the bottom of the compartment and an adjustable shelf above the tray. There shall be storage for strong backs and plywood on the upper shelf. There shall be one (1) 110v power outlet. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
	Left Side, rear compartment (L4)	There shall be two (2) 110v-charging outlets. There shall storage for two (2) battery operated super vac PPV fans, a two-piece stokes basket, four rechargeable stream lights, Rapid Intervention (RIT) pelican box and RIT duffle bag. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features. There shall be space for two (2) chain saws and one (1) K12.	_____
11.149	Right side, front compartment (R1)	This compartment shall be shared with L1. There shall be storage for backboard, scoop stretcher, four (4) Technical Rescue equipment backpacks approx. 80lbs each bag, (3) fire extinguishers. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____

11.150	Right side, center compartment (R2)	This compartment shall be a pass through. This compartment shall have two (2) heavy duty vertical pull out tool boards with mounting for rescue struts and fire fighting tools. The tool boards shall be the maximum allowable height of the compartment. The minimum height the tool boards shall be is 40" high to accommodate the vehicle rescue struts. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
11.151	Right side, rear compartment (R3)	This compartment shall be a pass through. There shall be one (1) adjustable shelf. There shall be storage for strong backs and plywood. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
	Right side compartment (R4)	Homaltro Penteon battery operated VR tools, Spreader, cutter. Mini cutter and rams, two (2) Sawzall's, large portable toolbox with extrication tools, tarps. Four high pressure air bags and controller. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
11.152	Rear compartments	There shall be a rear compartment with two pull out trays on adjustable shelves. The upper tray shall be tilting. There shall be a separate recessed lower compartment that is between the frame rails to store 30" 4x6 cribbing. These two compartments shall share a common roll up door.	_____
	Roof Mount Storage	There shall be coffin compartments on the roof of the apparatus to accommodate storage for dirty turn out gear and other lightweight fire fighting tools. This area shall also allow easy access to service of the APU and Command light. There shall be pull out ladder with a flip down section to allow easy access to the roof.	_____
	Equipment Compartments/Back Board/Scoop		
11.153	Equipment compartments	The bidder shall design all equipment compartments to accommodate the equipment specified in RESCUE EQUIPMENT and item 17.0 Appendix #1. The bidder shall be responsible for its location, securing, and weight distributions. All tool brackets shall be PAC mount tool-mounting hardware included within the compartment construction as per attached tool list. Fire Extinguishers stored horizontally in compartments.	_____
11.154	SCBA storage	Eight (8) SCBA storage pods. There shall be storage for four (4) SCBA high pressure forty-five hundred psi air cylinder storage pods within the rear wheel well fenders on each side of the apparatus. The pods shall be equipped with weather tight doors c/w slam locks.	_____

11.155	Rear step	NFPA compliant and the step height shall be 22 in. (559 mm) above ground level. Step surfaces shall be non-slip and drain opening shall be provided to facilitate cleaning of the non-slip surfaces.	_____
11.156	Wheel wells	Equipped with full liners 5052-H321 aluminum or composite materials wheel fender and lined with Line-X or Full Metal Jacket protective spray on liner.	_____
11.157	Checker plate	The front corners and the area immediately above the wheel wells shall be covered with polished aluminum or stainless-steel checker plate.	_____

ELECTRICAL SYSTEMS, GENERAL

11.158	Electrical	The complete Heavy Rescue Apparatus shall be equipped with a multiplex electrical system. Vmux or other multiplex systems shall be accepted. All electrical wiring harness shall be encased in pre-engineered weatherproof loom. All harness connections shall be weather tight connections. Each circuit shall be colour coded and/or marked the entire length. The marking shall be easy to read. Individual wires shall be multi-strand copper with cross linked polyethylene insulation. Volts drop in any electrical wiring circuit shall not exceed 0.5 volts at highest operating temperature within normal working range.	_____
11.159	Wiring	All wiring shall be in pre-engineered harnesses with weatherproof, guided pin-snap-together connectors. Each circuit shall be colour coded and marked the entire length of the wire with easily read numbers and/or letters for identification.	_____
11.160	Connectors	Where crimp-on type electrical connectors are necessary, the connectors shall be fastened to the wiring, pull tested to 40 lbs., then sealed using heat shrink tubing.	_____
11.161	Solder	Any soldered connections shall be performed using flux core solder, then sealed using heat shrink tubing. Acid and/or acid core solder shall not be used.	_____
11.162	Electrical standard	All wiring shall be properly secured and routed. All holes required for routing shall be grommeted and sealed as required.	_____
11.163	Circuit breakers	Circuit breakers shall be used in lieu of fuses for all circuits requiring overload protection (reset type circuit breakers preferred). All circuit breakers and relays shall be located behind quick removable panels, located to be readily accessible for servicing. All circuit breakers and relays shall be labelled to indicate their function.	_____

11.164	Electrical distribution panels	The electrical distribution panels for the apparatus body shall be located in an easily accessible location for the maintenance people to access. The panels shall have a removable weather tight front cover. The dedicated ground cable shall have a ground terminal in these panels with sufficient connection point available for all circuits.	_____
11.165	~~**Battery Idle Reduction Technology (IRT)**~~	~~**Bidder to state optional price for Battery IRT system. The Apparatus shall be equipped with a battery idle reduction system. The battery IRT system shall be able to idle for 5min and then the chassis engine will shut off and all electrical loads will be run off of lithium ion batteries. There shall be an hour meter for the IRT system. The battery IRT system shall be able to control the HVAC system independent of the chassis engine. Must be able to heat and cool the cab in extreme temperatures.**~~	_____
	Head Set communications	Headset communications. Headset system located in the cab. System shall consist of five Bluetooth head sets.	_____
	Power Distribution	Each compartment shall have a blue sea power and ground distribution block to all for future accessory add-ons. There shall be a Blue Sea 12V power distribution module model 5032. Location: behind officer's seat.	_____

VEHICLE LIGHTING AND WARNING EQUIPMENT

11.166	All lighting to conform to: C.M.V.S.S. Manitoba Highway Traffic Act. City of Winnipeg Lighting Visibility Standard http://winnipeg.ca/matmgt/pdfs/PublicWorksEquipLightingVisibility.pdf.		_____
11.167	Lighting	Supplier installed **high count** LED lighting	_____
11.168	LED optical warning system	The apparatus shall have an LED optical warning system that meets and exceeds NFPA 1901.	_____
11.169	Light bar (LED)	One (1) Whelen Freedom 60” LED Light Bar. There shall be a White Light Disable switch in the cab to manually turn off the White light function in the event of fog or snow. Directed to front and sides only. Back of front light bar shall not be equipped with lighting individual switches shall be provided for alley included in light bar.	_____
11.170	LED lights	FireTech 72" 12V brow light with integrated marker lights and black housing. Includes switch acc-essible to driver. Replaces front brow marker lights.	_____

11.171	Warning Lights	Warning light Whelen M-Series LED or equivalent. Color: Red with red lenses. Location: (1) each side of cab down low just ahead of rear doors. Warning light Whelen M-Series LED or equivalent. Color: Amber with clear lenses. Location: (1) each side of body rear facing up high. Warning light Whelen M-Series LED or equivalent. Color: Red with red lenses. Location: (1) each side of body rear facing up high. Warning light Whelen M-Series LED or equivalent. Colour: Red with red lenses. Location: (1) each side of body on forward upper body corners. Warning light Whelen M-Series LED or equivalent. Color: Red with red lenses. Location: (1) each side of body on rearward upper body corners.	_____
11.172	Warning light Package	Whelen Super LED lower level warning light package. Includes (8) M-Series LED lights and (2) ION-T Series model TLI light heads with bezels or equivalent. Color: Red with red lenses. Location side facing lights: at forward most position, centered in rear wheel well, and side facing at rear of body in rubrail if equipped. Note: ION-T Series light only available with clear lenses or equivalent.	_____
11.173	Traffic Advisor	Whelen 500 Series TAL 85 LED, c/w controller. The arrow stick shall be mounted in the rear of the body below the hose bed. Wiring shall run continuously to the in-cab controller.	_____
11.174	Scene lights	FireTech FT-GESM scene lights and weatherproof connectors. Switch in cab (driver and officer side lights switched separately). (1) Each side rear compartment faces up high. FireTech FT-GESM scene lights weatherproof connectors. Switch in cab (driver and officer side lights switched separately). (1) Each side of cab, rearward of forward doors, up high, switched with cab doors. FireTech FT-GESM scene lights weatherproof connectors. Switch in cab (driver and officer side lights switched separately). Driver side forward and rearward areas of roof top storage compartment. FireTech FT-GESM scene lights and weatherproof	

		connectors. Switch in cab (driver and officer side lights switched separately). Officer side forward and rearward areas of roof top storage compartment. Fire Tech FT-MB-2.15-F-B-CPREC adjustable Scene light. Located in the middle of the rear body, mounted up.	_____
11.175	Load management system	An automatic electrical load management system to be provided.	_____
11.176	Taillights	Whelen M series LED vertical mount tail lights. Includes LED stop/tail, arrow turn and back-up lights with vertical chrome ABS 4 housing and weatherproof connectors.	_____
	LED Head Lights	Fire Tech 4x6 LED head lights. FT-4X6-4KIT	_____
11.177	Turn signals	Weldon auxiliary turn signal model 9186-8580 LED (PR). Location: (1) each side in body wheel well offset forward, as per NFPA 1901 (current edition).	_____
11.178	Wig wags	Alternately flashing headlights operating on high beam only.	_____
11.179	Siren	Federal PA 4000-200 Pathfinder Siren system with two (2) speakers with mounted in the front bumper spaced as wide apart as possible. Federal Rumbler secondary siren. Includes amp, timer, and two speakers mounted under vehicle with heavy fabricated brackets. Requires control switch. The siren speakers must be insulated to prevent excessive noise in the cab	_____
11.180	Warning lights and siren controllers	The warning light controller shall be mounted with the arrow stick controller mounted to the right of the driver for primary operation by the driver from the normal seated position. The officer's position shall be equipped with a siren tone control switch. This switch when activated shall only be able to change siren tones of siren wail, yelp and electronic air horn. It will not select stand by or on/off selection. The switch position shall be to the left of the officer. Officer to operate Siren to be a Federal PA 4000. Federal Rumbler secondary siren. Includes amp, timer, and two speakers mounted under vehicle with heavy fabricated brackets. Requires control switch.	_____
11.181	Air horns	Two (2) heavy-duty air horns mounted in the front bumper. The air horns shall be operable from the driver's position via the steering wheel and a foot switch. There shall also be an air horn switch for the officer located on the dash close to the officer seat.	_____ _____

11.182	Back-up alarms	Electronic, self-adjusting (87-112 dB) type.	_____
11.183	Spotlights	Stream light waypoint 400 series, LED handheld spot light with rechargeable batteries. Spot light to include mount, located on the officer's side.	_____
11.184	Light tower	Command Light CL602D-FE LED. Tower shall be self-sustaining and capable to supplying power required for the lighting system. To be run off vehicle 12 Volt system. To be mounted on top of rear body. The Command light shall have control from the multiplex display as well as the handheld controller. The command light shall have the automatic zone deploying feature.	_____

RESCUE EQUIPMENT

The following equipment shall be supplied as part of the apparatus and shall be mounted where applicable. All fire fighting equipment shall be mounted with proper weight distribution in mind

11.185	Variable speed PPV blower	Super Vac Fan model #V18-BD battery operated PPV fan with 110v option. The supervac fan shall run off of Milwaukee batteries	_____

	PAINT COLOUR	The HEAVY RESCUE APPARATUS shall be painted as follows:	
11.186	Cab	Painted two tone colour scheme with the bottom half Red to match SIKKENS Brand Code 911662 (Red) and the top half Black to match SIKKENS Brand Code 910788 (Black), using a polyurethane enamel paint. (DuPont Imron or Sikkons paint).	_____
11.187	Apparatus body	Painted red to match the bottom half of the cab.	
	Chrome Accents	All body components that are normally chrome shall be painted black, including the front bumper.	_____
11.188	Apparatus body compartments, interior	Painted with light grey, scratch resistant, automotive grade paint.	_____
11.189	Chassis Frame, Axles, & Undercarriage	Painted using smooth black corrosion resistant paint. Paint Application - All paint shall be applied in accordance with the paint manufacturer's recommendations. All surfaces shall be properly cleaned, prepared and primed with a suitable primer prior to painting. Painting shall have been performed in an atmosphere-controlled spray booth. The cab and Aerial Ladder Platform body shall have been painted with all trim and hardware removed. All mounting holes shall have been drilled and deburred and nutserts shall be installed in blind holes prior to painting. Any caulking of body seams shall be performed prior to painting. Caulking material shall be of the highest industry	

		standards.	_____
11.190	Paint application	All paint shall be applied in accordance with the paint manufacturer's recommendations. All surfaces shall be properly cleaned, prepared and primed with a suitable primer prior to painting. Painting shall have been performed in an atmosphere-controlled spray booth. The cab and apparatus body shall have been painted with all trim and hardware removed. All mounting holes shall have been drilled and deburred and nutserts shall be installed in blind holes prior to painting. Any caulking of body seams shall be performed prior to painting. Caulking material shall be of the highest Industry standards.	_____
11.191	Reflective stripping	All reflective striping shall be 3M diamond grade striping where ever possible. The reflective striping shall be red on white and/or aluminum background and white on red background. The side striping shall be stylized Z pattern front to back of vehicle. The striping shall be composed of 5 bands. The band width shall be 10". Example: white stripe on red background. From top down shall be: one 1" white stripe, one 1' red stripe, one 6" white stripe, one 1" red stripe, one 1" white stripe. The stripes shall not be spaced apart to reveal background. The stripe shall be edge sealed as per 3M guidelines. Incorporated within the cab reflective stripe shall be stylized WFD. Cab drivers and officer's door shall be location of Winnipeg Fire Department crest (size 12 ¾" x 12" wide) crest shall be within reflective stripe. Were diamond grade reflective striping is difficult to apply; series 680 reflective film shall be allowable Example: on roll up door slats. The reflective striping shall at all times meet and/or exceed NFPA 1901 as the standard guideline. The reflective striping on the cab rear entrance doors shall incorporate the Fire Department's stylized WFD' logo. (A diagram of the logo shall be provided to the Contractor by the City).	_____
	NOISE LEVEL		
11.192	Sound level	The sound level in the cab at all seated positions shall not exceed 80 dB(A), measured in accordance with SAE J336, with the apparatus traveling at any speed up to governed speed with the sirens off and doors and windows closed. **Bidder to provide recommendation for extra sound insulation. State dba.**	_____
	TESTING & CERTIFICATION		
11.193		Testing - The completed vehicle shall be tested and labelled to (NFPA) National Fire Protection	

		Association Standard latest revisions by the manufacture.	_____
	LABELLING		
11.194	Labelling	A warning label shall be provided in the cab within sight of the driver stating the seating capacity of the cab/crew cab.	_____
11.195	Safety Labelling	A warning label shall be provided in the cab within sight of the driver stating the seating capacity of the cab/crew cab.	_____
11.196	Dimension Plate	A warning label shall be provided in the cab within sight of the driver stating the following vehicle dimensions: • Height and length in standard and metric measurements. • Gross vehicle weight rating in pounds and kilograms.	_____
11.197	Voltage Testing	The wiring and permanently connected devices and equipment shall be subject to a dielectric voltage withstand test of 900 volts for one minute. The testing shall be performed after all body work has been completed. The electric polarity of all permanently wired equipment, cord reels, and receptacles shall be tested to verify that wiring connections have been properly made.	_____
11.198	Fluid Capacity and Type Label	A permanent label shall be provided and shall state the type and quantity of the following fluids used in the vehicle: • Engine Oil • Engine Coolant • Chassis Transmission Fluid • Drive Axle Fluid • Pump Gear Case • Primer Lubricant (If Applicable)	_____
11.199	Vehicle Data Recorder	Meeting the requirements of NFPA 1901-2009, Vehicle Data Recorder is required. Recorded to Include the following Data: • Vehicle Speed • Acceleration • Deceleration • Engine Speed • Engine Throttle Position • ABS Event • Seat Occupied Status • Seat Belt Status • Master Optical Warning Switch • Park Brake • Service Brake • Time	

		• Date • Engine Hours	_____
11.200	Inputs	Five (5) seat position inputs for occupied and belts buckled. Additional six (6) seat expansion module available. Easily interfaces with V-MUX™ or other multiplexing systems. Data is extracted by a standard, mini USB cable	_____
11.201	Occupant restraint indicator	Occupant Restraints designed to alert driver and officer, this module will indicate where restraints of occupied seats are properly fastened keeping personnel safe. The indicator shall be low profile compact size. Support commercial and custom cab seating layouts up to 12 seats. A dimming feature adjusts indicator intensity to synchronize with dash lights and have a built-in audible alarm. All the seat sensor wiring connectors shall have Deutsch connectors	_____
11.202	Visual Tire Pressure Monitoring	There shall be a visual six (6) wheel tire pressure system supplied that monitors all of the tires on the vehicle. An LED valve cap shall be attached to the tires valve-stem that contains a Pressure Sensor to alert the operators of a developing tire problem	_____
11.203	Transportation Road Safety Kit	Fire Extinguisher One (1) 2.5 lb. ABC vehicle type fire extinguisher with mounting bracket. First Aid Kit- One (1) standard First Aid Kit shall be provided. Warning Flares- One (1) set of three (3) dual faced triangular warning flares to meet the Department of Transportation's Motor Vehicle Safety Standards	_____
	DRAWINGS		
11.204	Two (2) sets of three (3) view drawings showing complete unit including chassis, body, compartments, tool locations, etc.	Bidders shall include drawings, within 72 hours of the request of the Contract Administrator.	_____

12.0 **WARRANTY**

12.1 The successful bidder shall have the sole warranty responsibility of all apparatus components. The warranty on the complete vehicle shall include 100% replacement parts and labour at no cost to the City and shall cover the complete equipment and all parts thereof against defects of workmanship, construction and materials for two (2) years from the date the equipment is put into service by the City of Winnipeg. _____

12.2	All warranty information shall be detailed and includes all exclusions. The successful bidder shall provide all published warranty information upon delivery of the equipment. Contractor shall State: all warranty information.		_____
12.3	**BODY WARRANTY**		
12.4	Structural	**State:** Terms: _____	_____
12.5	Body Vehicle basic coverage	**State:** Terms: _____	_____
12.6	Body compartment latches, hinges and shelving	**State:** Terms: _____	_____
12.7	Components e.g. Pumps	**State:** Terms: _____	_____
12.8	Electrical	**State:** Terms: _____	_____
12.9	Body Lighting	**State:** Terms: _____	_____
12.10	Body Paint	**State:** Terms: _____	_____
	CAB & CHASSIS WARRANTY		
12.11	Basic Vehicle - Chassis	**State:** Terms: _____	_____
12.12	Electrical	**State:** Terms: _____	_____
12.13	LED Lighting	**State:** Terms: _____	_____
12.14	Batteries	**State:** Terms: _____	_____
12.15	Drivetrain	**State:** Terms: _____	_____
12.16	Cab Structure/Corrosion	**State:** Terms: _____	_____
12.17	Frame & Cross-Members (Structural)	**State:** Terms: _____	_____
12.18	Frame & Cross-Members (Corrosion)	**State:** Terms: _____	_____
12.19	Cab Paint	**State:** Terms: _____	_____
12.20	Engine	**State:** Terms: _____	_____
12.21	Transmission	**State:** Terms: _____	_____
12.22	Axles - Front & Rear	**State:** Terms: _____	_____
12.23	Components	**State:** Terms: _____	_____
12.24	Warranty Administration Coordinator	The successful Contractor shall have a dedicated person allocated and available 24/7 to receive phone calls and determine, co-ordinate, schedule and have the ability to authorize all warranty related issues which arise during the warranty period.	_____
12.25	Third Party	In the case where the Contractor proposes that warranty work be performed by a third party or by the	

		City of Winnipeg Fire Paramedic Service, the Contractor shall include a written detailed estimate. Any work performed by the Fire Paramedic Service Mechanical Services Branch will be charged to the Contractor at the Branch's shop rate in effect at the time the work is performed.	_____
12.26	Importance	The vehicle is of vital importance to the City in providing essential services and, accordingly, all warranty items brought to the attention of the Contractor by the City shall be rectified expediently. The City reserves the right to affect warranty repairs to the vehicle, at full cost to the Contractor, should the Contractor fail to perform in a timely manner.	_____
12.27	Warranty Literature	All warranty literature and Documentation or "fine print" documentation provided within three (3) Business Days of the request from the Contract Administrator. This warranty documentation will be entered into the City of Winnipeg Fire Department's Service Data Network to expedite and administrate warranty claims and repairs.	_____

13.0 **DELIVERY**

13.1 Delivery Point: The complete unit shall be serviced, ready for operation and delivered F.O.B. with the freight prepaid, including invoice and N.I.V.S. (if applicable) to the WFMA 185 Tecumseh Street, Winnipeg MB. The Contractor shall be notified by the Contractor Administrator the delivery address prior to issuance of the purchase order. _____

13.2 Delivery Time: Equipment shall be delivered between 8:00 am and 2:00 pm on Business Days
State: Delivery Date
The apparatus purchased through this contract shall be delivered within 24-32 months. There shall be a bonus award for apparatus that can be delivered prior to delivery date. All apparatus received after the agreed upon delivery date shall be subject to a penalty that increases every month past the delivery date. _____

13.3 Delivery Contact: The Contractor shall contact the Contract Administrator prior to delivery of the equipment. _____

13.4 P.D.I: A pre-delivery inspection shall be performed by the Winnipeg Fire Paramedic Service on the Apparatus and equipment. _____

14.0 **MANUALS & OEM DIANOSTIC SOFTWARE**

14.1 Manuals supplied under this Contract shall cover the complete equipment including all components thereof; CD or USB flash drive is preferred where available. _____

14.2 The following manuals shall be supplied with the units when delivered:

a) Operator's manual – Two (2) per unit (one operator manual shall be sent to the Winnipeg Fire Paramedic Service Training Academy 2546 McPhillips Street Winnipeg, Manitoba
Office: 204-986-8398
Fax: 204-986-4266

b) Parts and service manuals – One (1) complete set including preventative maintenance schedules. CDs or USB flash drive are preferred.

Manuals supplied under this Contract shall cover the complete equipment including all components thereof; USB flash drive is preferred where available.

The following manuals shall be supplied with the units when delivered:

a) Operator's manual – Two (2) per unit (one operator manual shall be sent to the Winnipeg Fire Paramedic Service Training Academy 2546 McPhillips Street Winnipeg, Manitoba
Office- (204).986.8398
Fax- (204).986.4266

a) Parts and service manuals – One (1) complete set including preventative maintenance schedules. USB flash drive are preferred.
b) OEM diagnostic software for the following systems shall be provided to WFPS: SRS and OEM multiplex software. Any other OEM software that may
pertain to the maintenance and operation of the apparatus shall be noted to WFPS for future consideration. _____

TRAINING AND EDUCATION
The contractor shall provide OEM familiarization training to WFPS on the new fire apparatus. The contractor shall also be responsible to work with the WFPS Heavy Fleet Repair Shop to provide OEM level training and education on the maintenance and repair of the fire apparatus. _____

15.0 **PARTS / LABOUIR PRICING**

15.1 Bidder to provide City of Winnipeg Parts Discount % Pricing from retail parts pricing. **State: percentage discount** _____ %

15.2 Bidder to provide City of Winnipeg Labor Discount % Pricing from Retail shop labor rate. **State: percentage discount** _____ %

16.0 **FIRST SERVICE PREVENTATIVE MAINTENANCE KIT:**

16.1 If applicable, in order to assure minimum downtime of the Equipment in future service, the Contractor must provide one (1) complete replacement set of new OEM filters for each unit purchased. The set of required filters shall include (if applicable to the equipment type) air, fuel, oil, transmission, cab and hydraulic,

or otherwise all known necessary common replacement filters required for the first preventative maintenance servicing and first transmission service. _____

16.2 The Contractor must provide a list of factory recommended lubricants to be used with the equipment, as well as a complete cross reference guide for all warranty approved lubricants and filters that can be used during Preventative Maintenance servicing. _____

FORM N(R1): DETAILED SPECIFICATIONS 23030

FIRE PUMPER APPARATUS

1.0 DESCRIPTION OF EQUIPMENT/APPLICATION

1.1 These specifications describe **Fire Pumper Apparatus** and other equipment and features as specified herein. The Winnipeg Fire Paramedic Service (WFPS) wishes to acquire fire pumper apparatus that is a highly specialized piece of equipment that will be responding to fire, rescue, medical and various other types of calls. The vehicle must incorporate the highest level of safety components to effectively protect WFPS personnel when travelling in and subsequently when operating this unit.

1.2 The **Fire Pumper Apparatus** shall be a new 2024 model year or newer.

1.3 The **Fire Pumper Apparatus** and all other items/components shall be the manufacturer's latest model. The equipment shall be furnished complete and ready for operation. Any parts or accessories not specifically mentioned, but which are required to complete and place the equipment and associated attachments in successful operation shall be furnished as though specifically mentioned in these specifications. The equipment and associated attachments, and all parts thereof, shall conform in strength and quality of material and workmanship, to the best standards and engineering practice of the industry.

1.4 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 equipment.

2.0 OTHER SPECIFICATIONS AND STANDARDS

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

2.2 The **Fire Pumper Apparatus** shall comply with the applicable regulations:

(NFPA 1901) National Fire Protection Association Standard latest revisions

Transport Canada, National Safety Mark, NSM:
http://www.tc.gc.ca/eng/acts-regulations/acts-road.htm

Manitoba Safety and Health Regulation, Parts 12, 16, 22:
http://web2.gov.mb.ca/laws/regs/current/217.06.pdf

Canadian Motor Vehicle Safety Standards C.M.V.S.S.
http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1038/section-sched3.html

PART B - Manitoba Highway Traffic Act regulations and requirements including, but not limited to, a Manitoba Government Inspection with Safety Sticker.
http://web2.gov.mb.ca/laws/regs/index.php?act=h60

Canadian Standards Association, CSA:
http://www.csagroup.org/

Under Writers of Canada, U/L:
http://www.ulc.ca/

Society of Automotive Engineers, SAE:
http://www.sae.org/

City of Winnipeg Lighting Visibility Standard:
http://winnipeg.ca/matmgt/pdfs/PublicWorksEquipLightingVisibility.pdf.

2.3 In Canada, Modification to new vehicles can only be done at facilities that are recognized by Transport Canada. All of these facilities must have a National Safety Mark from Transport Canada. Transport Canada National Safety Mark is a label that indicates that the modifications are compliant with all current Canadian Motor Vehicle Safety Standards (CMVSS).

STATE (NSM) # _____

2.4 The vehicle shall be complete with a current Manitoba Safety Sticker affixed to the driver's side window.

2.5 It will be the responsibility of the Bidder to inform the City of any deficiencies in these specifications, for under this Contract the Contractor shall be held responsible for the design, performance, reliability and satisfactory operational function of the units.

3.0 SERVICE FACILITY

3.1 For the purpose of warranty repairs, the Bidder shall have an authorized service facility located within 10 km of the boundaries of the City of Winnipeg. The facility, or a portion thereof, shall be dedicated to the service and maintenance of the type equipment being offered. Further to 9.1, Bidders shall provide a description of the service facility including, but not limited to, number of qualified service staff, years of service experience, and general service capabilities within three (3) Business Days upon request of the Contract Administrator. The Winnipeg Fire Department's Emergency Mechanical Services Branch shall be an authorized warranty repair facility. The emergency mechanical services branch shall have the ability to do authorized warranty repair work and provide an invoice to bill back parts and labour to the bidder. It shall be the decision of the Director of the Emergency Mechanical Services Branch as complete the warranty work at the WFPS facility or to send the work to the OEM for warranty. The OEM service facility must be able to start the requested work within three (3) business days.

4.0 REFERENCES

4.1 Provide five (5) references where this equipment is used in a working environment where climatic conditions are similar to the City of Winnipeg.

5.0 MAKE & MODEL

5.1 **State** make, year and model of the equipment bid- _____

6.0 INSTRUCTIONS FOR COMPLETION OF SPECIFICATIONS

6.1 Each bid will be evaluated based on adherence to all terms, conditions and requirements outlined in the Bid Opportunity package.

6.2 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 and/or equivalents shall be clearly stated and fully detailed. Deviations and/or equivalents will be considered subject to evaluation. In every instance where a brand name or design specification is used, the City will also consider deviations and/or equivalents.

6.3 **EACH BIDDER IS REQUIRED TO FILL IN EVERY BLANK. FAILURE TO DO SO MAY BE USED AS A BASIS FOR REJECTION OF BID**

7.0 PERFORMANCE RELIABILITY

7.1 The responsibility for the design of the **Fire Pumper Apparatus**, its performance and reliability shall rest upon the Contractor.

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

7.3 Where the **Fire Pumper Apparatus** develops “repeated failures” in service, the Contractor shall make any necessary engineering changes, repairs, alterations or modifications in order to guarantee reliability of performance.

7.4 The equipment shall be capable of consistent top performance in City of Winnipeg Environment. Note: The City of Winnipeg has four seasons with ambient temperatures ranging from approximately 90°F (32°C) to -40°F (-40°C)

8.0 FUEL

8.1 Where applicable, all equipment must be full of fuel upon delivery **(no exceptions).**

9.0 QUALIFICATIONS OF MANUFACTURER & CONTRACTOR

9.1 The manufacturer of the **Fire Pumper Apparatus** shall have experience manufacturing the equipment.

9.2 The manufacturer shall have in effect a documented quality control program ensuring that the quality of materials and workmanship, including welding, conforms to the best standards and engineering practice of the industry.

9.3 The Contractor shall have experience servicing, repairing and maintaining **Fire Pumper Apparatus** of the type being offered.

10.0 CHASSIS SPECIFICATIONS

GVWR, DIMENSIONS, WEIGHT DISTRIBUTION & TURNING RADIUS

10.1 Weights:

The Truck shall not exceed the City of Winnipeg’s limit for gross vehicle weight, axle and tire loads

Note: The City of Winnipeg and the Province of Manitoba limits the gross vehicle weight and axle and tire loads to:

- Front axle (steering axle) – 7300 kg (16,094 lbs.)
- Rear axle (single axle) – 9100 kg (20,062 lbs.)
- Tire load – 9 kilograms for each millimeter width of tire (approximately 500 lbs. per inch of tire width). _____

10.2 **Weigh Scale Ticket:**
The Contractor shall provide a certified weigh scale ticket upon delivery of the completed unit. The scale ticket shall include front and rear axle weights including five (5) operators, full of water, foam all equipment as specified in this tender and full of fuel. _____

10.3 **Weight distribution:**
State weight distribution with water and foam and all associated tools and equipment.
Front: _____

Rear: _____

10.4 **Center of gravity:**
The vehicles shall meet all safety standards in relation to center of gravity. _____

10.5 **GVWR**
Gross vehicle weight rating (GVWR), **state.** _____

10.6 **Front (GAWR)**
Gross axle weight rating front (GAWR), approx. 21,000lbs. shall be a 10% greater than actual vehicle weight carried on front axle, **state.** _____

10.7 **Rear (GAWR)**
Gross axle weight rating rear (GAWR), approx. 27,000lbs. shall be 10% greater than actual vehicle weight carried on rear axle, **state.** _____

10.8 **Tare weight**
State the tare weight of the apparatus being bid:

Front: _____
Rear: _____
Total: _____

10.9 **Dimensions**
State the following dimensions: (***Note: No part of the vehicle, including lights, shall exceed the overall height specified.***

a) **Overall width** – Shall not exceed 102 in. _____

b) **Overall height** – Shall not exceed 126 in. _____

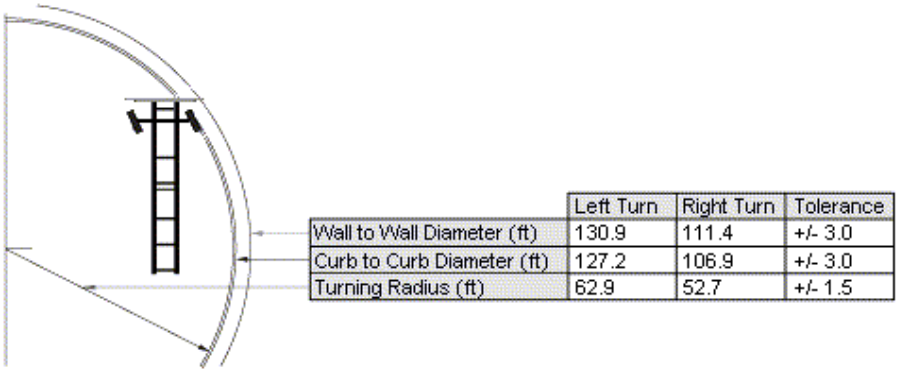
c) **Overall length** – Shall not exceed 33 ft. Preference is to achieve as short an overall length as possible. _____

d) **Wheelbase** – **State.** _____

e) **Ground clearance** – Shall not be less than 8 in. _____

f) **Turning Radius**- **State** turning radius- See example: _____

10.10 **Turning Radius- State** the vehicle turning radius, wall to wall. Curb to Curb.
Example:



	Left Turn	Right Turn	Tolerance
Wall to Wall Diameter (ft)	130.9	111.4	+/- 3.0
Curb to Curb Diameter (ft)	127.2	106.9	+/- 3.0
Turning Radius (ft)	62.9	52.7	+/- 1.5

a) **Wall to Wall (ft.)** _____
b) **Curb to Curb(ft.)** _____

c) **Turning Radius (ft.)** _____

ENGINE

10.11	Type	Six cylinder Cummins diesel or Detroit with integrated exhaust brake. Must meet current EPA Standards. Cummins diesel Tier IV Final - Emergency Service Vehicle) rated.	_____
10.12	Engine location	Over front axle.	_____
10.13	Horsepower	Approximately 400-500 HP gross.	_____
10.14	Torque	Approximately 1250-1800 lbs-ft.	_____
10.15	Engine governor	Electronic, compatible with fire pumper operation.	_____
10.16	Oil drain plug	Magnetic type.	_____
10.17	Oil filter	As recommended by the engine manufacturer, full flow, spin-on filter.	_____
10.18	Fuel filter/primary	Recommended by the engine manufacturer, spin-on filter, remote mounted on the chassis frame such that it is easily accessible for servicing. **Filter not to have plastic lower bowl.**	_____
10.19	Fuel filter/secondary	(If recommended) spin-on filter. The filter shall be remote mounted on the chassis frame, easily accessible for servicing.	_____
10.20	Starter	12-volt electric. The starter shall be shielded from exhaust heat where required.	_____
10.21	Air cleaner	Heavy-duty replaceable element, dry type, as recommended by the engine manufacturer.	_____

ENGINE COOLING SYSTEM

10.22	Engine cooling	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 95F (35C) to -45F (-43C). 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 normal operating temperature of the coolant system shall be approximately 180F (92C).	_____
10.23	Radiator	Pressurized type with surge tank or coolant recovery system.	_____
10.24	Fan drive	Thermostatically controlled fan clutch, viscous type or air clutch.	_____

10.25	Coolant	**Extended Life** coolant, antifreeze to -35°F (-37°C).	_____
10.26	Coolant filter	Spin on type, as recommended by manufacturer.	_____
10.27	Coolant hoses	Green line heavy-duty heater hose P#G6304-063.	_____
10.28	Hose clamps	Spring loaded constant torque type.	_____

ELECTRICAL SYTEM

10.29	Electrical supply	Multiplex Electrical System, Cold Cranking Amp Heavy Duty Batteries, Battery Charging System, Ground Wire, and Heavy Duty Alternator with thermal protection and over crank protection**.**	_____
10.30	Batteries	Four (4) batteries, 12-volt, group 31, approximately 2700-2850 CCA.	_____
10.31	Battery location	Galvanized battery housing **state** location.	_____
10.32	Battery cables	4/0 gauge, colour coded welding type cable, with connector ends crimped, pull tested and sealed with heat shrink tubing at all connections. Positive battery cables must be secured to the frame and isolated from shorting to ground. All battery & starter cables shall be properly isolated from the frame rail and secured individually so they won't rub against each other.	_____
10.33	Battery charging system	Kushmaul Auto Eject Pump Plus onboard battery charger and air brake compressor.	
	Battery boosting terminals	Battery boosting terminals. Must be located ahead of the front wheels and accessible with the cab in the lowered position.	_____
10.34	Charging system plugin	Located between driver's door and the rear passenger door. Automatic ejector type with a 20 Amp receptacle. Located approx. 60 to 80 in. (1524 – 2032 mm) above ground level. Charging plug in cannot be located in the step well.	_____
10.35	Ground wire	The electrical wiring harness shall have a dedicated ground wire running the full length of the truck. Weather tight junction boxes shall be provided at the dash, pump panel and the rear of the truck. This ground wire shall be connected directly to the battery negative post. All electrical systems shall be grounded to this ground wire. The total resistance of this ground wire shall not exceed 0.2 Volts drop at any point with all circuits turned on. The conventional grounding system using the frame shall be maintained. Ground wires must be secured to the frame rail.	_____
10.36	Alternator	320 or greater Amp Leece Neville alternator.	_____

10.37	Battery disconnect	Power to all electrical systems shall be wired through a power disconnects 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 _____ _____ _____ _____ _____ _____	_____

FUEL SYSTEM

10.38	Fuel tank	Approx. 50 Imp. Gallons (227L) Capacity. Fuel tank to be mounted as high as possible in the frame.	_____
10.39	Fuel transfer pump	Pump is to be external to fuel tank, back flow checked and in line with fuel supply lined.	_____

EXHAUST SYSTEM

10.40	Horizontal muffler and exhaust	Aluminized or stainless steel.	_____
10.41	Tailpipe	Located on the right side of the apparatus, suitable for use with an exhaust extraction system. The tailpipe shall be 90 degree to the rub rail, shall extend ½ in. (13 mm) beyond the rub rail and shall be 3 in. (76 mm) below the rub rail. Hanger brackets shall be 18 in. (457 mm) from the rub rail. **Note: The tailpipe configuration is intended for use with a "Plymovent" exhaust disconnection system and shall include the installation of the magnetic adapter.**	_____
10.42	Exhaust Accessories	The body manufacturer on the vehicle shall ship an exhaust temperature mitigation device loose for installation. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.	_____
10.43	Exhaust ~~**Diverter**~~	~~**a) An exhaust diverter valve shall be located in-line of exhaust tubing and controlled from driver's position to re-route exhaust discharge. Exhaust diverter valve shall be constructed from 14 gauge stainless steel material with an electric actuator control.**~~ ~~**b)** As a default, the exhaust shall always discharge to curbside just ahead of rear wheels, **and when selected the exhaust shall discharge to a**~~	_____

~~**vertical exhaust pipe, extending above the body height 12".**~~ _____

c) The exhaust piping and discharge outlet shall be located or shielded so as not to expose any portion of the apparatus or equipment to excessive heating. _____

d) Exhaust pipe discharge shall be directed away from any operator's position. _____

e) Where parts of the exhaust system are exposed so that they are likely to cause injury to operating personnel, protective guards shall be provided. _____

TRANSMISSION

10.44	Transmission	Transmission shall be an Allison EVS 4000 automatic transmission as for Fire and Emergency use and rated for the requested horsepower and torque. The transmission shall have an intergraded hydraulic transmission retarder.	_____
10.45	Torque converter	As recommended by the Manufacturer.	_____
10.46	Direct drive lockup	For pumping operation.	_____
10.47	Shifter	As recommended by the Manufacturer.	_____
10.48	Transmission filter	As recommended by the Manufacturer.	_____
10.49	Drain plug	Magnetic type.	_____
10.50	Oil level dipstick	Bayonet type with high and low level markings.	_____
10.51	PTO opening	For this application.	_____

DRIVE SHAFTS

10.52	Drive shaft	Drive shaft Spicer 1710 Series drive shafts with Glide-coat splines. Bidder to provide engine/transmission SCAN and OEM recommendations for best-suited match.	_____
10.53	Drive shaft clearance	Adequate clearance to allow for greasing of the drive shaft U-joints from underneath the vehicle.	_____

AXLES AND SUSPENSION

10.54	Front axle	21,000 lbs. capacity c/w oil lubricated wheel bearings.	_____
10.55	Front Suspension	Heavy duty independent front suspension (IFS) air ride or torsion bar shall be accepted	_____

10.56	Shock absorbers	Front, heavy duty, double acting.	_____
10.57	Rear axle	Meritor single speed axle, 27,000 lbs. capacity. Heavy-duty differential housing.	_____
10.58	Drive ratio	Capable of achieving 110 km/hr (65 mph).	_____
10.59	Differential drain plugs	Magnetic type.	_____
10.60	Differential vent	Remote vent. Vent to c/w 10 micron breathable filter, water/dust cap and check value.	_____
10.61	Rear suspension	Hendrickson Firemaax air ride suspension with capacity to best match GVWR to come with levelling valve for each spring.	_____

WHEELS AND TIRES

10.62	Front wheels	**Alcoa Standard polished,** 10 bolt.	_____
10.63	Front tires	Michelin, 315/80R 22.5 or equivalent 2OPR Michelin XZ3.	_____
10.64	Rear wheels	**Alcoa Standard polished,** 10 bolt.	_____
10.65	Rear tires	Michelin 11R or 12R22.5 16PR, Michelin XDN2.	_____
10.66	Spare wheel & tire	One (1) wheel and tire to match front wheel and tire. Spare wheel & tire to be shipped loose.	_____

BRAKE SYSTEM

10.67	Brake system	Full air service brake system with spring loaded parking brakes and an anti-lock system.	_____
10.68	Antilock braking system	Comes with roll stability control, Meritor/Wabco four channel systems, providing independent antilock braking control at four wheels and traction control at rear drive wheels.	_____
10.69	Disc brakes (front)	Front disc brakes.	_____
10.70	Drum brakes (rear)	Meritor outbound drum brakes rear.	_____
10.71	Slack adjusters	Meritor automatic type.	_____
10.72	Parking brakes	Spring set parking brake on rear service brake system.	_____
10.73	Air lines	Colour-coded, reinforced nylon tubing.	_____
10.74	Air compressor	Water-cooled, pressure-lubricated compressor, approx. 18.CFM capacity. The compressor air intake shall be plumbed into the engine air intake after the air cleaner. Air compressor shall be sized properly to run all air brake systems and the air primer.	_____

10.75	Air dryer	Heated, spin-on desiccant type.	_____
10.76	Moisture ejector	Heated, automatic, in wet tank only.	_____
10.77	Drain valves	Cable operated manual drain valve P#WA12105, in each air tank except the wet tank. The cables shall be vinyl coated and shall terminate at the bottom at the bottom edge of the cab or at the rub rail on the body.	_____
10.78	Auxiliary air reservoir	Nominal 1200 in^3 (20 L) air reservoir to operate the vehicle air horns and to function as an emergency parking brake release. A dash-mounted control, located directly below the main parking brake release, shall allow the air in the reservoir to be used to release the parking brakes. The control shall be non-detented, spring return type such that it cannot be left engaged in the brake release position. There shall be a second auxiliary air tank that is directly connected to the air primer system.	_____
10.79	External air inlet	Milton A style air fitting installed on left side of chassis so the WFD can plug their shop air lines into the truck. Shall be plumbed to the outlet side of the air dryer for the option to put alcohol into the air system without going through the dryer.	_____
10.80	Airline sources	All air lines shall be sourced after the air dryer.	_____
10.81	Auxiliary pump	Kushmaul auto pump plus.	_____
10.82	Park brake valve location	Park brake valve must be located as close to the driver as possible. This item shall be discussed at the preproduction meeting.	_____

STEERING

10.83	Power steering	Hydraulic power steering with thermostatically controlled oil cooler, tilt and telescopic style, rated for front GVWR rating.	_____
10.84	Steering wheel	2 spoke. Padded style.	_____

FRAME

10.85	Galvanized frame and components	Galvanized steel single or double frame rail(s) designed and constructed to match the GVWR and application of the vehicle as a triple combination fire pumper apparatus. The frame shall be hot dip galvanized prior to assembly and attachment of any components. OEM shall provide engineering document that supports single or double frame application choice. The frame rails shall have an OEM approved undercoating. The components that shall be galvanized shall include: • Main frame “C” channel or channels	

- Front splayed rails and fish plates
- Cross members (excluding suspension cross members)
- Cross member gussets
- Fuel tank mounting brackets
- Fuel tank straps
- Air tank mounting brackets
- Exhaust mounting brackets
- Air cleaner skid plate
- Radiator skid plate
- Battery supports, battery trays and battery covers _____

10.86 RBM — Resisting bending moment combined for both frame rails 3,200,000 in-lbs. RBM shall be rated for GVWR request, application and intended use. _____

10.87 Front frame extension — Bolt on as required for front bumper stated herein. _____

10.88 Front bumper — Heavy duty front bumper. Bumper bolted to the chassis frame. Bumper apron to be 3/16" –anti-slip. The front bumper shall have 45 degree angled corners. There shall be Chevron on the front face of the bumper. Front exterior operations hose line storage for two 50ft lengths of 44mm hose. Front bumper shall have a hole on the right side of apparatus for traffic cones. There shall be a strap to hold cones in place. _____

10.89 Front tow hooks — Frame shall have forward “forks” to which the eyehooks are affixed. _____

10.90 Rear tow hooks — Two (2) eyehooks, bolted to the chassis frame. A cross-member shall be located in the chassis frame at the tow hook location. The tow hooks shall be easily accessible. _____

CAB AND CAB EQUIPMENT

10.91 Custom cab

a) This apparatus shall fully incorporate a clean cab concept. The clean cab shall allow for easy decontamination. The cab interior shall be of a light color to show dirty easily. There shall be anti-slip seamless cab floor to allow for easy decontamination and washing. There shall be no firefighting equipment stored in the cab. The details of the clean cab shall be discussed at the preproduction meeting. _____

b) The cab shall be a custom, fully enclosed, with a raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the

			vehicle. This style of cab shall offer up to five (5) seating positions.	_____
			c) The cab shall have two SCBA seats located on the rear wall that face forward. These two seats shall be positioned in the middle of the rear wall to allow for a clear forward view of the fire scene. There shall be a third seat that is offset to one side that functions as a jump seat and has a flip up seat bottom. There shall be enough space between the three forward facing rear seats to allow crew personnel to be seated comfortably.	_____
			d) There shall be an exterior medical compartment on both side of the cab located between the front and rear doors. These compartments shall be heated and have roll up doors. These compartments shall have one adjustable shelf.	_____
10.92	Cab design	a)	The cab shall incorporate a fully enclosed design with sidewall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial.	_____
		b)	Adhesives designed specifically for aluminum fabrication for construction.	_____
		c)	Cab tilt system shall allow for electric over hydraulic tilting of the cab with a permanently mounted rocker switch mounted in the right side pump panel. Cab tilt system shall include a hydraulically operated manual cab tilt option in the event the pump fails.	_____
10.93	Cab construction	a)	The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.	_____
		b)	The cab shall be constructed of corrosion resistant aluminum plate. The cab shall be constructed from minimum of 3/16” 6061-T6 or 6063-T6. Aluminum extrusions for extreme duty situations. The cab and sub structure shall create an occupant compartment that will create	

		a roll over protection system. The cab shall meet or exceed NFPA 1901 standards. The cab shall be fully crash test rated.	_____
10.94	Cold weather insulation	Extreme climate full insulation under cab, doors, roof, ceiling, firewall, and walls and vinyl padding package for walls and ceiling. Insulation shall be non-hygroscopic, mildew proof and fire retardant. Vinyl shall be grey, heavy-duty automotive type. Also as required to meet HVAC needs and acceptable sound suppression requirements.	_____
10.95	Interior and exterior seams	All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favourable efficiency for heating and cooling retention.	_____
10.96	Exterior width	The exterior width of the cab shall be a min 94.00 inches wide with an interior width of a minimum of 88.00 inches. The overall cab length shall be a maximum of 146 in. with 60.00 in. from the centerline of the front of the axle to the back of the cab or equivalent.	_____
10.97	Cab interior design	The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.	_____
10.98	Cab interior height	The cab shall offer an interior height of 57.25 inches from the front floor to the headliner and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 55.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.	_____
10.99	Cab doors	The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall have an opening with minimum of 36 inches wide X a minimum of 53.50 inches high. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of a minimum 33.75 inches wide X a minimum of 61.00 inches high, from the cab floor to the top of the door opening. The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.	_____

10.100	First step area (Driver and Officer)	The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.50 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 33.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.	_____
10.101	First step area (Crew)	The first step for the crew area shall measure approximately 11.50 inches deep X 21.50 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.50 inches.	_____
10.102	**Note: Bidders shall supply a drawing showing the cab interior layout and relevant dimensions.**		_____
10.103	Insulating material	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.	_____
10.104	Door handles/latches exterior	As recommended by manufacturer.	_____
10.105	Door handles/latches interior	Flush-mounted, paddle handle type, located such as to prevent accidental actuation.	_____
10.106	Door latch striker plates	Recessed such as not to protrude into the door opening area.	_____
10.107	Door hinges	As recommended by manufacturer.	_____
10.108	Weather stripping	Automotive style.	_____
10.109	Grab handles	Grab handles as per NFPA standard. Grab handles shall be of a one piece design with a hook to hang turn out gear coat	_____
10.110	Step area lights	LED recessed, side mounted light in each entrance step area. The lights shall be activated by door switches.	_____
10.111	Seats/seating layout	All seats shall be SCBA seats be manufactured by H.O. Bostrom or Emergency 911 with grey non-absorbent extreme duty vinyl. Three Front Facing seats on rear wall of cab	_____
10.112	Driver’s seat	H.O. Bostrom or emergency 911 air seat 5" Fore/Aft Adjust and occupancy switch.	_____
10.113	Officer’s seat	SCBA seat H.O. Bostrom or emergency 911 air seat with 5" Fore/Aft Adjust, and occupancy switch.	_____
10.114	Air seat supply	Air supply for the seats shall be taken from the auxiliary air reservoir.	_____

10.115	Rear seats	SCBA seat, Forward Facing Crew (2): HO. Bostrom or Emergency 911 seat and occupancy switch. One SCBA jump seat.	_____
10.116	Seat belts	Three-point, retractable type for all seats. Seat belts shall be designed to be long enough for large operators, and female Deutsch connections to extend so as to be easily accessible.	_____
10.117	Winter Front	Apparatus shall come with a custom fit removable winter front with adjustable openings that allow air to go through if required.	_____
10.118	Occupant Protection System	The system shall include the following components: a) Driver steering wheel airbag.	_____
		b) Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.	_____
		c) Large driver, officer, and crew area side curtain airbags.	_____
		d) Seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.	_____
		e) Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event.	_____
		f) Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM.	_____
		g) Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel.	_____
10.119	Floor covering	Heavy-duty rubber anti-slip seamless floor-mat that is non-absorbent and works with the clean cab concept and will allow for easy decontamination. The floor covering shall extend 3" up the cab wall to assist with cleaning the cab.	_____
10.120	Headliner	Grey, heavy duty non-absorbent vinyl with padding.	_____
10.121	Windows	Tinted safety glass for all windows including windshield. Apparatus shall be equipped with **manual crank** windows.	_____
10.122	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 drivers switch panel.	_____
10.123	Sun visors	Two (2) swivel visors. One positioned each in the front of the driver and officer. These visors swivel to provide coverage of the front door windows.	_____
10.124	Mirrors exterior	a) The cab exterior shall include bus style mirrors, one (1) mounted on the drivers' door and one (1) mounted on the right front cab corner radius below the windshield. Flat and convex mirrors heated and remote controlled located within easy reach of the driver.	_____
		b) Left side mirror head, injection moulded chrome plated ABS plastic that measures approx. 9.50 inches wide X 17.50 inches high and is mounted with a polished die-cast aluminum arm.	_____
		c) Right side mirror, injection moulded chrome plated ABS plastic that measures approx. 9.50 inches wide X 17.50 inches high and is mounted with a 19.00 inch long polished cast aluminum arm.	_____
10.125	Front/Rear heater and air conditioner	Heating/Ventilating/Air Conditioning System(HVAC) The HVAC shall be a high output, fresh air type with multi-speed fan, controlled by the driver. There shall be a HEPA filtration system capable of stripping the outside air of pollen, bacteria, and pollution before they enter the cabin and systematically scrubbing the air inside the cabin to eliminate any trace of these particles air. Outlets shall be provided at dashboard level and in the driver and officer's foot area to ensure occupant comfort when heat is required. Defroster outlets shall be provided to defrost entire windshield and the drivers and officers side windows. Coolant flow (preferred) in the heater circuit shall be passively controlled by a dash mounted heat control device. The system/s shall meet or exceed the BTU's required to heat/cool the cab for the temperatures common to the City of Winnipeg, i.e., 35°C, to -40°C and be able to maintain proper engine coolant temperature.	_____
10.126	Rear heat/air conditioner~~/Aux. coolant heater~~	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.	
10.127	Dome lights	LED four (4) lights, two (2) in the front and two (2) in the rear portion of the cab to fully illuminate the cab interior. Dome lights shall be combination type with clear and red lenses. All lights shall be operated by door switches.	_____
10.128	Rear crew area interior work lights	There shall be four evenly spaced 8" LED work lights. These four lights shall be wired to a manually operated rocker switch located in the rear crew area that is interlocked to only operate when the park brake is applied.	_____
10.129	Instrumentation	Full instrumentation on a removable or flip down panel, or pullout gauges.	_____
10.130	Metric instrumentation	To include, but not 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 lights(s) g) Voltmeter h) Fuel level gauge i) Air reservoir pressure gauge(s). j) Engine hour meter. k) Air cleaner restriction indicator gauge. l) Engine oil filter bypass indicator lights. m) Fuel filter bypass indicator lights. n) Transmission filter bypass indicator lights if recommended.	_____
10.131	Ignition switch and Master Power	Keyless ignition system with lockable master power switch.	_____
10.132	Doors	Heavy-duty construction with stainless steel inside door panels. Doors shall have a led light that flashes when the door is open.	_____
10.133	Warning system	OEM engine warning system.	_____
10.134	Radio	AM/FM stereo, mounted inside of dash, controlled by the driver.	_____
10.135	Mobile radio	12 V power & ground located at center dash area **(To be prewired during manufacture as determined at pre-production meeting).**	_____
10.136	Lap top computer provision	12 V power & ground at center dash area (purchaser to supply support bracket) **(To be prewired during manufacture as determined at pre-production meeting).**	_____

10.137	USB charging ports	Two (2) located at center dash area.	_____
10.138	Automatic Vehicle Immobilizer	The anti-theft system shall be automatically activated upon application of the apparatus park brake. There shall be a hidden momentary switch to disengage the anti-theft.	_____
10.139	Cab door hardware	Hardware to be heavy duty in design and operator glove friendly.	_____

FIRE PUMP AND ASSOCIATED EQUIPMENT

10.140	Hale fire pump	Hale QMAX XS or Darley 1500-1750gpm, mid-ship factory mounted, single stage centrifugal fire pump with a rated capacity of 1500-1750 (US) GPM @ 150 psi.	_____
10.141	Pump overheat protection system	Thermal relief valve with automatic reset.	_____
10.142	Pump Anodes	Three (3) pump magnesium anodes, to protect pump by reducing galvanic corrosion. Two (2) suction and 1-discharge anodes.	_____
10.143	Relief valve system	Relief valve system shall provide discharge and suction protection (against excess pressures), control located on pump operator's panel. The intake relief valves shall be set to 215 psi. **Note: Inlet relief valve to be plumbed to drain when pump not in use, c/w manual drain if required.**	_____
10.144	Priming pump	Double barrel air primer. Primer shall have an isolated auxiliary air tank sized correctly to supply air for the air primer system.	_____
10.145	Piping	All intake and discharge piping shall be sized to meet or exceed the flow capacity corresponding to the intake and outlet discharge size, taking into account flow loss (resistance) due to valves, elbows, port openings, etc. All pipes shall be corrosion resistant, schedule 40, stainless steel, butt welded continuous length pipes.	_____
10.146	Valves	All intake and discharge valves shall be sized to meet or exceed the flow capacity corresponding to the intake or discharge size. 4 in. Valves may be either gate or piston type with 30° elbow, c/w pressure relief valve. Valves 3 in. (76 mm) or larger shall be slow opening type, meeting NFPA requirements. All valves shall be controlled from the pump operator's panel. Valve sizes at various locations are specified herein. All balls valves shall be Akron valves.	_____
10.147	Suction relief control valve	Shall be mechanical.	_____

10.148 Pump intakes

Intakes shall be provided as follows:

10.149

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

_____

10.150 The 6 in. (152mm) intakes

The 6 in. (152 mm) intakes shall be located to provide sufficient clearance for hard suction lines. Both intakes shall be equipped with a Hale Master Intake Valve (MIV) or equivalent, removable strainers and 6 in. to 4 in. Storz reducer and suction intake drain.

_____

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

10.151 Tank-to-pump line

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

_____

(Design Engineering) Victaulic coupling- A development in which a groove is cut around each end of pipe instead of the usual threads; two ends of pipe are then lined up and a rubber ring is fitted around the joint; two semicircular bands, forming a sleeve, are placed around the ring and are drawn together with two bolts, which have a ridge on both edges to fit into the groove of the pipe; as the bolts are tightened, the rubber ring is compressed, making a watertight joint ,while the ridges fitting in the grooves make it strong mechanically.

10.152 External tank fill intake the top

Intake shall be provided as follows: to fill tank from the top.

_____

10.153

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

_____

10.154 Intake plumbing

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

the intake. The intake shall be labelled “tank fill” and shall be equipped with a cap with a vinyl coated, stainless steel cable or an approved alternative. _____

10.155 Pump discharge outlets

Discharge outlets shall be provided as follows:

10.156

DISCHARGE OUTLET LOCATION	QTY	SIZE	THREAD TYPE	GATED
Right Side Pump Panel	1	4 in.	Storz	Yes
Right Side Pump Panel	1	2½ in	WCT (Male)	Yes
Rear, Right	1	4 in.	Storz	Yes
Rear, Left	1	2½ in.	WCT (Male)	Yes
Transverse (Cross Lay) Area	2	1 ¾”	National Standard (Male)	Yes
Front exterior operations line	1	1 3/4” in.	National Standard (Male)	Yes
Rearward of Transverse (Deluge)	1	4 in.	National Standard (Male)	Yes
Pump-to-Tank Fill Line	1	1½ in.	National Standard (Male)	Yes
Left side pump panel	1	2½ in.	National Standard (Male)	Yes
Left side pump panel	1	4” in.	National Standard (Male)	Yes

_____

10.157 Piping for the right and rear

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

10.158 Valves for the right and rear

The valves for the right and rear 4 in. (102 mm). Storz discharge outlets sized to achieve rated flow capacity of outlet. C/w Akron Model # 8840 and manual hand wheel. _____

10.159 Piping for the 1¾ transverse and front outlet

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

10.160 Valves for the 1 ¾ transverse and front outlet

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

10.161 Rear discharge outlets

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

10.162 Discharge outlets

The 1 ¾” (38 mm) discharge outlets in the transverse area shall be equipped with chicksan swivel joints located in the forward cross lay area, partially recessed in the centre of the transverse floor such as to prevent the fire hose from kinking

		when pulled in either direction. The swivel joints shall lay flat and shall not swivel below floor level.	_____
10.163	Vertical discharge outlet	The vertical discharge outlet shall be located Immediately to the rear of the transverse hose bed. The outlet shall be adequately sized for use with the monitor specified herein.	_____
10.164	Monitor	TFT Flex deck gun and nozzle with telescoping technology mounted on the vertical discharge outlet with 360° rotation without hitting the cab with the water steam. There shall be a Bluetooth wireless remote control for the monitor. Mounting for the wireless controller shall be located on the pump operator's panel. The monitor shall be mounted as low as possible so as to not increase the overall height of the apparatus.	_____
10.165	Drain valves	Innovative Control 1/4 turn valve with "T" handle and label. Individual or ganged manual ball valve, located in the lowest section of all discharge and intake piping that is not equipped with automatic drains and in the pump to completely drain the entire system. Drain valves shall be ¾ in. (19 mm) diameter. The controls for all manual drains valves shall be located near the drain valve outlet and shall be appropriately labelled.	_____
10.166	Pump compartment	The pump compartment shall be split into two modules. Fully enclosed on all sides including the bottom with hinged door for access to pump. The bottom portion of the enclosure shall be a removable, bolt-on, minimum 3/16 in. (5 mm) aluminum pan constructed with a 2 piece loose fitted aluminum panel. All discharge, intake and foam drain valves in the pump area shall be located inside the pump compartment. The pump compartment shall have all large open areas to be sealed with rubber to assist with keeping the heat in the pump house.	_____
10.167	Pump panels	The pump panel shall consist of two modules. The first module will have all the intake and discharge valves and the second module shall have all the pump operator controls such as valve controllers, pressure governor and all associated gauges. The pump panel shall have speedlay tray housing area with two lightweight speedlay trays. The speedlay trays shall hold two-hundred feet of 1 ¾" fire hose in each tray. The speedlay tray housing shall be at an ergonomic height to allow for easy removal and installation of the trays. The right and left side pump panels shall be minimum 14 ga. stainless steel, designed to permit easy removal without disassembly of any pumps, gauges, controls, inlets, outlets, drains, lighting or electrical componentry.	

		Trim plates, located behind the main pump panels, shall be used to provide a well-sealed pump panel and a clean appearance. The trim plates shall be easily removed when the main pump panel is removed. Gasket Material around all Discharges, Intakes and Handle Slots on Pump Panel to hold in heat of Module Plumbing.	_____
10.168	Access panel	A large access panel to the pump compartment shall be provided. The panel shall be easily removable and permit sufficient access to pump and valving for repairs. There shall be a bolt on removable panel to allow for easy removal of the MIV valves.	_____
10.169	Pump compartment heater	Two (2) 35,000 BTU Red Dot coolant heaters, suitable to prevent freezing of the pump and plumbing. The heater shall be located to be protected from damage and water spray. The heater shall be equipped with an on/off switch, located for convenient operation on the pump operator's panel.	_____

PUMP DRIVE

10.170	Pump drive	The pump shall be driven via a split shaft main drive with a single speed transfer case with 4th gear lockup solenoid mounted in pump house. Separate power for the pressure governor and 4th gear lock up solenoid.	_____
10.171	Shifting mechanism	Shifting mechanism shall be an air operated shift mechanism bolted to the transfer case.	_____
10.172	Shift control	The pump shift control located in the cab for operation from the driver's position. The shift control lever shall have a positive locking feature or protective cover to prevent accidental disengagement.	_____
10.173	Warning lights	Two warning lights at the shift control and one light at the pump operator's panel, in accordance with N.F.P.A. requirements, shall indicate when the transfer case shift to pump operation has been completed and the transmission is in pump gear.	_____

PUMP OPERATOR'S PANEL

10.174	Location	Driver side with roll up door. The control panel shall be located behind a full length and width roll-up door. The LED strip lighting shall illuminate the entire pump panel without causing glare for the operator.	_____

10.175	Pump operator's panel (left)	The pump operator's panel shall be separate from the pump panel with the intakes and discharges and shall contain the following controls, gauges, warning lights, etc. a) Priming control. Trident air primer b) Water tank level gauge, FRC, Hale or Class 1 digital tank level gauge. c) Foam system controls and display. d) Foam tank level gauge: Hale, FRC or Class 1, digital tank level gauge. e) Monitor remote controls f) Heater controls for pump compartment heater. g) Manufacturer to supply a label specifying the tank size in Imperial Gallons. h) Control levels for intake and discharge valves	_____
10.176	Panel plate	Stainless steel plate with slots for the valve control handles. The slots shall be fully sealed using flexible rubber boots.	_____
10.177	Name plates	Color coded, metal nameplates, block lettered in English, for all controls, gauges, warning lights, etc.	_____
10.178	NFPA 1901 test plate	Located on or immediately above the pump operator's panel. The plate shall show discharge flows and pressures in SI units (L/min, kpa).	_____
10.179	Passenger side pump panel	The pump panel shall be located behind a full length and width roll-up door (Amdor or equivalent). The LED strip lighting shall illuminate the entire pump panel without causing glare for the operator. There shall be a second screen for the automated pump control system.	_____
10.180	Tank capacity label	Volume of the tank in Imperial gallons to be mounted at tank level indicator.	_____
10.181	Diagram (control panel)	Bidders shall provide a diagram illustrating the control panel layout.	
	Pump panel anchor points	Left and right-side pump panel to have two anchor points one each side to allow for fire hose to be secured.	_____
	WATER TANK		
10.182	Construction	Polypropylene construction.	_____
10.183	Baffles	Longitudinal and transverse baffles as recommended by the manufacturer to prevent excessive water movement and reaction.	_____
10.184	Capacity	600-800 Imperial gallons. The WFPS will be using two different water tank capacities in its fleet depending on the geographical location of the fire	

		station. The capacity shall change as required by WFPS.	_____
10.185	Fill tower	Top access filler, easily identified and utilized by the user. The top of the fill tower shall be approximately even with the top of the apparatus body side. The fill tower cover shall be clearly labelled “water only”.	_____
10.186	Overflow vent	Located to drain directly to ground, clear of any chassis, fuel tank and driveline components.	_____
10.187	Sump	Located in the front of the tank such as to allow use or draining of the total tank capacity. The drain function shall be activated from the left side at the rub rail and from the lowest part of the tank.	_____
10.188	Outlet fitting	4 inch NPT female flange fitting for the tank to pump line, located in the front of the sump. An anti-swirl device shall be provided on the inside of the sump at the outlet.	_____
10.189	Fill line fitting	2½ in. (64 mm) NPT female fitting for the pump-to-tank fill line. A deflector shield inside the tank shall direct the water flow when filling.	_____
10.190	Mounting	The tank shall be securely mounted in such a manner as to allow the tank to float sufficiently to prevent damage due to chassis frame movement including twisting. The tank shall be supported along its entire perimeter by an aluminum cradle bolted to the chassis frame. The cradle shall be lined with ¼ in. (6 mm) thick rubber at all points of contact with the tank.	_____
10.191	Lift eyes	Threaded bosses for attaching lift eyes for removal of the tank shall be built into the top of the tank.	_____
10.192	External tank drain	Located at lowest part of the tank and operated from pump panel. Tank drain must be clear of the frame rails and any components. If its mounted external from the heated pump house it shall be insulated.	_____

FOAM SYSTEM

10.193	Foam system	Electronic control, direct injection, foam concentrates proportioning system with Class “A/B” foam capability. Foam system is to be installed as per manufacturer’s instruction and must be capable of supplying the lines.	_____
10.194	Foam injector	Located in the outlet manifold to supply foam concentrate to both 1½ in. (38mm) cross-lays, trash line and to the 2½ in. (64mm) rear outlet.	_____
10.195	Controller	Digital display/controller located at the pump operator’s panel.	_____

10.196	Foam tank	30 Imp. gallons (136 L) capacity tank, designed specifically for foam system use. The foam tank shall be securely mounted or an integral part of the water tank. The foam tank shall have a shut off valve on the outlet side to allow for mechanical work to be completed.	_____
10.197	Fill tower	Top access filler, located adjacent to the water tank fill tower. The fill cover shall be equipped with a latch, easily operated by a miffed hand, and may be held in the open position without the use of a prop rod. The top of the fill tower shall be even with the water tank fill tower. The fill tower cover shall be clearly labelled “A FOAM ONLY” and shall positively seal when closed.	_____
	APPARATUS BODY	**Note: Compartment configurations to be finalized at Pre-production meeting. All tools shall be mounted for proper weight distribution.**	
10.198	Type	a) Rescue style, heavy-duty style body, aluminum or 304L stainless. If submitting an aluminium body extruded aluminum will only be accepted, (no exceptions). Shall be tongue and groove or interlocking of the components. ***Note: Aluminum or 304L stainless bodies on steel sub frame shall not be acceptable***	_____
		b) The body compartments doors shall be roll up doors with pull down straps; lower door that folds down to a step/seating area. The fold down step shall include a positive lock. The fold down step would allow for easy access to the higher compartment shelves. Designs without the lower door will be accepted.	_____
10.199	Rub rail	Extruded aluminum rub rail, bolted in place and located along the lower edge of the body, both sides nonconductive.	_____
10.200	Compartment floors	All compartment floors shall be a minimum 3/16 in. (5mm), with continuous welds.	_____
10.201	Insulating material	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.	_____
10.202	Drip mouldings	Located above all compartment door openings.	_____
10.203	Storage compartments	Located along each side and rear of the body and the storage compartments. Shall provide a combined interior volume. All compartments will have rollup doors.	_____
10.204	Compartment design	All compartments shall have vents for ventilation. All compartments shall have sweep-out style compartments. Bottom shelves to have provisions	

		for water drainage.	_____
10.205	Compartment doors	Roll-up doors lock/lifting bars c/w door Ajar warning circuit c/w magnetic sensor located near top of door. The door sensor shall have a mounting bracket that is bolted to the compartment. (Sensors on door handles not acceptable) All compartment doors shall have anodized aluminum slats. The roll up door drum shall have a drip tray.	_____
10.206	Warning circuit	"Door ajar" warning circuit to indicate an open storage compartment door with a nominal 2 in. (51 mm) diameter flashing red warning light located in the cab and shielded to protect from visibility from oncoming traffic. The multiplex system shall identify which door is open independently of the other doors on the multiplex screen.	_____
10.207	Compartment lights	LED lighting in each compartment to the right and left of opening, full length of opening. The opening of each compartment door shall activate the lights in each compartment.	_____
10.208	Shelves	All compartment shelves shall be 3/16 in. (5 mm) aluminum and shall cover the full width of the compartment. Shelves shall be lined with an Interlocking matting, dry-deck or equal.	_____
10.209	Slide-out trays	All slide-out trays shall be 3/16 in. (5 mm) aluminum with heavy-duty steel sliders, with ball bearing rollers capable of supporting a capacity of 500 lbs. The slide-out trays shall have paddle-handle type latches with dual point locks or dual T-handle type latches. The trays shall lock in the open and closed positions. All slide out trays shall be marked with chevron pattern decal.	_____
	Compartment Descriptions		
10.210	Left side, front compartment (L1)	Three (3) adjustable full width shelves. Shelf rails to start 18' from bottom of compartment. Location for remote controls for Command Light and Monitor. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
10.211	Left side, center compartment (L2)	Equipped with one (1) adjustable shelf. This compartment shall have one (1) 110v electrical outlet with power bar. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
10.212	Left side, rear compartment (L3)	To include a 12" wide, full height storage area. The remainder of the compartment shall have 2 adjustable shelves and 1 roll out tray at the bottom of the compartment. Shelf rails to start 18' from bottom of compartment. Storage options shall allow for future equipment additions. Builder to provide	

		optimal storage options and features.	_____
10.213	Right side, front compartment (R1)	Two (2) adjustable full width shelves. Adjustable bracket rail to start 18” from bottom of compartment. Horizontal slide in compartments to accommodate three portable fire extinguishers. Back wall to be lined with PAC mount tracking. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
10.214	Right side, center compartment (R2)	Equipped with one (1) adjustable shelf. This compartment shall have one (1) 110v electrical outlet and power bar. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
10.215	Right side, rear compartment (R3)	Two full width adjustable shelves and one pull out tray at the bottom of the compartment. Shelf rails to start 18’ from bottom of compartment. Storage options shall allow for future equipment additions. Builder to provide optimal storage options and features.	_____
10.216	Rear compartment	Rear compartment shall have one full width pull out tray.	_____

Equipment Compartments/Ladders/ Back Board/Scoop

10.217	Ladder storage	There shall be in an enclosed compartment and shall be incorporated into the body design. The ladder compartment access shall be easily accessible to operators. It is preferred that the ladder storage be in the centered in the rear of the apparatus to allow for full sized compartments on both sides of the apparatus. Ladder storage shall be able to accommodate the below. Bottom of compartment no higher than 72" from the ground. Ladder storage options shall be discussed at the preproduction meeting.	_____
10.218	Ladders	Ladder storage shall be able to accommodate: One (1)24ft 2-section extension ladder, Duo-Safety. One (1) 14 ft. (4.3 m) roof ladder with folding roof hooks, Duo-Safety 1200 Series One (1) 10 ft. (3.0 m) folding (attic) ladder, Duo-Safety 585-A Series.	_____
10.219	Back board & scoop storage compartment	Storage capability for one (1)Back Board measuring 6' X 18" and one (1) Scoop Stretcher measuring 6' X 18". With a width of approximately 12" and with the bottom of the compartment at or below 72" high from the ground.	_____
10.220	Pike Poles	To be incorporated into a compartment no higher than 72" from the ground and may be part of the ladder compartment.	_____

10.221	Equipment compartments	The bidder shall design all equipment compartments to accommodate the equipment specified in FIRE FIGHTING EQUIPMENT and Appendix #1. The bidder shall be responsible for it location, securing, and weight distributions. All tool brackets shall be PAC mount tool mounting hardware included within the compartment construction as per attached tool list. Fire Extinguishers stored horizontally in compartments.	_____
10.222	SCBA storage	Four (4) SCBA high-pressure (45) minutes cylinder storage pods within rear wheel well fenders on each side of the apparatus. The pods shall be equipped with weather tight doors c/w slam locks.	_____
10.223	Rear step	NFPA compliant and the step height shall be 22 in. (559 mm) above ground level. Step surfaces shall be non-slip and drain opening shall be provided to facilitate cleaning of the non-slip surfaces.	_____
10.224	Hose bed access steps	Located to allow personnel to climb from the rear step onto the hose bed. Step surfaces shall be aluminum anti-slip grip strut.	_____
10.225	Handrails	NFPA handrails, located to assist in access to hose bed.	_____
10.226	Wheel wells	Equipped with full liners 5052-H321 aluminum or composite materials wheel fender and lined with Full Metal Jacket protective spray on liner.	_____
10.227	Checker plate	The front corners and the area immediately above the wheel wells shall be covered with polished aluminum or stainless steel checker plate.	_____

HOSE BED

10.228	Hose bed dividers	All hose bed dividers shall run longitudinally.	_____
10.229	Hose bed loading (floor) height	Shall not exceed 72 in. above ground level.	_____
10.230	Hose bed bottom	The hose bed shall have a flat bottom of removable vinyl or aluminum slats and a smooth interior free of any projections such as bolts, brackets, etc., which may damage the fire hose. The hose bed dividers shall be adjustable partitions running full length front to back.	_____
		a) Space on the left for 800 ft. of 4 in. (102 mm) high volume rubber covered fire hose.	_____
		b) Centre walkway -slip resistant walkway required from the rear of the apparatus to the front of the hose bed (at the water and foam fill towers) nominal width 18 in. wide.	_____
		c) Space on the right-centre for 600 ft. of 2½ in. (64	

		mm) synthetic double jacket, rubber lined fire hose.	_____
		d) 200 ft. - 2 ½ in. preconnected c/w nozzle on extreme right side of hose bed.	_____
		***Note: Fire hose shall be supplied with the apparatus*.**	
10.231	Grab handles	Required at the rear of the centre walkway to the left and right side. The handles shall allow for a clear walkway and shall not interfere with the hose.	_____
10.232	Hose bed cover	Two-piece heavy duty anti-slip aluminum clam shell hose bed cover, with locking mechanism and limiting straps.	_____

TRANSVERSE SPEEDLAY AREA

10.233	Transverse (speed-lay)	The transverse (speed-lay) area shall be located at the rear of the pump panel and deluge standpipe to allow for easy access to pump compartment when the cab is tilted	_____
10.234	Transverse area	The transverse area shall be covered by checker plate aluminum panels (lids), hinged at the front. A rubber ball and socket, friction fit type locking device shall be used to secure each lid in the down position. The lids shall not interfere with the operation of the deluge gun or fill tower lids when in an open or closed position.	_____
10.235	Hose capacity	The transverse area shall provide sufficient space for two (2) cross-lays of 200 ft. (4 x 15 m) each, of 1¾ in. (44 mm) double jacket, rubber lined fire hose. A centre divider shall separate the two (2) cross-lays Speed lay trays measuring 8” wide. Both cross-lays shall be separately pre-connected to discharge outlets in the centre of the transverse floor. The transverse shall be large enough to hold the specified hose and pistol grip-nozzles.	_____
10.236	Transverse floor	Lined with removable vinyl or aluminum slats.	_____
10.237	Guides	Full-length stainless steel guides mounted along the bottom and sides of the transverse opening on each side of the apparatus.	_____
10.238	Handrails	Aluminum or stainless steel handrails with rubber grip inserts, located on the left side, right side and below the cross-lay area, on each side of the apparatus.	_____

ELECTRICAL SYSTEMS, GENERAL

10.239	Electrical	The complete Fire Pumper Apparatus shall be	

		equipped with a multiplex electrical system. Vmux or equivalent multiplex systems shall be accepted. All electrical wiring harness shall be encased in pre-engineered weatherproof loom. All harness connections shall be weather tight connections. Each circuit shall be colour coded and/or marked the entire length. The marking shall be easy to read. Individual wires shall be multi-strand copper with cross linked polyethylene insulation. Volts drop in any electrical wiring circuit shall not exceed 0.5 volts at highest operating temperature within normal working range.	_____
10.240	Wiring	All wiring shall be in pre-engineered harnesses with weatherproof, guided pin-snap-together connectors. Each circuit shall be colour coded and marked the entire length of the wire with easily read numbers and/or letters for identification.	_____
10.241	Connectors	Where crimp-on type electrical connectors are necessary, the connectors shall be fastened to the wiring, pull tested to 40 lbs., then sealed using heat shrink tubing.	_____
10.242	Solder	Any soldered connections shall be performed using flux core solder, then sealed using heat shrink tubing. Acid and/or acid core solder shall not be used.	_____
10.243	Electrical standard	All wiring shall be properly secured and routed. All holes required for routing shall be grommeted and sealed as required.	_____
10.244	Circuit breakers	Circuit breakers shall be used in lieu of fuses for all circuits requiring overload protection (reset type circuit breakers preferred).All circuit breakers and relays shall be located behind quick removable panels, located to be readily accessible for servicing. All circuit breakers and relays shall be labelled to indicate their function. Circuit breaker box cleared and labelled.	_____
10.245	Electrical distribution panels	The electrical distribution panels for the apparatus body shall be located in an easily accessible location for the maintenance people to access. The panels shall have a removable weather tight front cover. The dedicated ground cable shall have a ground terminal in these panels with sufficient connection point available for all circuits.	_____
~~10.246~~	**~~Battery Reduction Technology (IRT)~~**	**~~Bidder to state optional price for Battery IRT system. The Apparatus shall be equipped with a battery idle reduction system. The battery IRT system shall be able to idle for 5min and then the chassis engine will shut off and all electrical loads will be run off of lithium ion batteries. There shall be an hour meter for the IRT system. The battery IRT system shall be able to control~~**	

		~~**the HVAC system independent of the chassis engine. Must be able to heat and cool the cab in extreme temperatures.**~~	_____
10.246	110V Power Supply	The apparatus shall be equipped 110V charging outlets. There shall be two (2) 110V outlets in the rear of the cab and two (2) in the rear compartments, one on each side of the apparatus. These 110V charging outlets shall be powered when the apparatus is plugged into shore power.	_____
10.247	Head Set communications	Headset communications. Headset system located in the cab. System shall consist of four Bluetooth head sets.	_____
10.248	Power Distribution	Each compartment shall have a blue sea power and ground distribution block to all for future accessory add-ons. There shall be a Blue Sea 12V power distribution module model 5032. Location: behind officer's seat.	_____

VEHICLE LIGHTING AND WARNING EQUIPMENT

10.249	All lighting to conform to: C.M.V.S.S. Manitoba Highway Traffic Act. City of Winnipeg Lighting Visibility Standard http://winnipeg.ca/matmgt/pdfs/PublicWorksEquipLightingVisibility.pdf.		_____
10.250	Lighting	Supplier installed **high count** LED lighting	_____
10.251	LED optical warning system	The apparatus shall have an LED optical warning system that meets and exceeds NFPA 1901.	_____
10.252	Light bar (LED)	One (1) Whelen Freedom 60” LED Light Bar. There shall be a White Light Disable switch in the cab to manually turn off the White light function in the event of fog or snow. Directed to front and sides only. Back of front light bar shall not be equipped with lighting individual switches shall be provided for alley included in light bar.	_____
10.253	LED lights	FireTech 72" 12V brow light with integrated marker lights and black housing. Includes switch accessible to driver. Replaces front brow marker lights.	_____
10.254	Warning Lights	a) Warning light Whelen M-Series Super LED or equivalent. Color: Red with red lenses. Location: (1) each side of cab down low just ahead of rear doors.	_____
		b) Warning light Whelen M-Series Super LED or equivalent. Color: Amber with clear lenses. Location: (1) each side of body rear facing up	_____

high.

c) Warning light Whelen M-Series Super LED or equivalent. Color: Red with red lenses. Location: (1) each side of body rear facing up high. _____

d) Warning light Whelen M-Series Super LED or equivalent. Color: Red with red lenses. Location: (1) each side of body on forward upper body corners. _____

e) Warning light Whelen M-Series Super LED or equivalent. Color: Red with red lenses. Location: (1) each side of body on rearward upper body corners. _____

10.255 Warning light Package

Whelen Super LED lower level warning light package. Includes (8) M-Series heads and (2) ION-T Series model TLI light heads with bezels or equivalent. Color: Red with red lenses. Location side facing lights: at forward most position, centered in rear wheel well, and side facing at rear of body in rub rail if equipped. Note: ION-T Series light only available with clear lenses or equivalent. _____

10.256 Traffic advisor

Whelen 500 Series TAL 85 LED, c/w controller. The arrow stick shall be mounted in the rear of the body below the hose bed. Wiring shall run continuously to the in cab controller. _____

10.257 Scene lights

a) FireTech FT-GESM scene lights (PR) or equivalent with chrome flange (when required) and weatherproof connectors. Switch in cab (driver and officer side lights switched separately). (1) Each side rear compartment face up high. _____

b) FireTech FT-GESM scene lights (PR) or equivalent with chrome flange (when required) and weatherproof connectors. Switch in cab (driver and officer side lights switched separately). (1) Each side of cab, rearward of forward doors, up high. _____

c) FireTech FT-GESM scene lights (PR) or equivalent with chrome flange (when required) and weatherproof connectors. Switch in cab (driver and officer side lights switched separately). Driver side forward and rearward areas of roof top storage compartment. _____

d) FireTech FT-GESM scene lights (PR) or equivalent with chrome flange (when required)

		and weatherproof connectors. Switch in cab (driver and officer side lights switched separately). Officer side forward and rearward areas of roof top storage compartment.	_____
10.258	Load management system	An automatic electrical load management system to be provided with override switch.	_____
10.259	LED Head Lights	Fire Tech 4x6 LED head lights. FT-4X6-4KIT.	_____
10.260	Tail lights	Whelen M series LED vertical mount tail lights. Includes LED stop/tail, arrow turn and back-up lights with vertical chrome ABS 4 housing and weatherproof connectors.	_____
10.261	Turn signals	Weldon auxiliary turn signal model 9186-8580 LED (PR). Location: (1) each side in body wheel well offset forward. As per NFPA 1901 (current edition).	_____
10.262	Wig wags	Alternately flashing headlights operating on high beam only.	_____
10.263	Siren	Federal PA 4000-200 Pathfinder Siren system with two (2) speakers with mounted in the front bumper spaced as wide apart as possible. Federal Rumbler secondary siren. Includes amp, timer, and two speakers mounted under vehicle with heavy duty fabricated brackets. Requires control switch. The siren speakers must be insulated to prevent excessive noise in the cab	_____
10.264	Warning lights and siren controllers	The warning light controller shall be mounted with the arrow stick controller mounted to the right of the driver for primary operation by the driver from the normal seated position. The officer's position shall be equipped with a siren tone control switch. This switch when activated shall only be able to change siren tones of siren wail, yelp and electronic air horn. It will not select stand by or on/off selection. The switch position shall be to the left of the officer. Officer to operate Siren to be a Federal PA 4000.	_____
10.265	Air horns	Two (2) heavy duty air horns mounted in the front bumper. The air horns shall be operable from the driver's position via the steering wheel horn activator and a centre mounted chain.	_____
10.266	Back-up alarms	Electronic, self-adjusting (87-112 dB) type.	_____
10.267	Spotlights	Stream light waypoint 400 series, LED handheld spot light with rechargeable batteries. Spot light to include mount, located on the officer's side.	_____
10.268	Light tower	Command Light Knight series KL415A-FE 12V LED. Tower shall be self-sustaining and capable to	

		supplying power required for the lighting system. To be run off vehicle 12 Volt system. To be mounted on top of rear body. Command light shall have control from the multiplex display as well as the handheld controller.	_____

FIRE FIGHTING EQUIPMENT

10.269 **The following equipment shall be supplied as part of the apparatus and shall be mounted where applicable. All firefighting equipment shall be mounted with proper weight distribution in mind**

10.270	Hose	a) 10 lengths of 1¾ in. Double jacket, cloth lined fire hose coupled with 1½ in. NPSH.	_____
		b) One (1) 100ft. 1¾ in. rubber fire hose.	_____
		c) Twelve (12) 64 mm hose Angus ULTIMA double jacket, rubber lined fire hose coupled WCT.	_____
		d) Eight (8) 4" X 100ft Hi-Vol Storz.	_____
		e) Two (2) 4" X 50ft Hi-Vol Storz.	_____
	Variable speed PPV blower	Super Vac Fan model #V18-BD battery operated PPV fan with 110v option. The Supervac fan shall run off of Milwaukee batteries	_____
	Chain Saw	Sthil Fire Rescue chain saw	_____
	K12 Saw	Sthil Fire Rescue K12 saw	_____
	Thermal Imaging Camera	Bullard NXT thermal imaging camera	_____

	PAINT COLOUR	The apparatus shall be painted as follows:	
10.271	Cab	Painted two tone colour scheme with the bottom half Red to match SIKKENS Brand Code 911662 (Red) and the top half Black to match SIKKENS Brand Code 910788 (Black), using a polyurethane enamel paint. (DuPont Imron or Sikkons paint).	_____
10.272	Apparatus body	Painted red to match the bottom half of the cab.	_____
	Chrome Accents	All body components that are normally chrome shall be powered coated or Linex black, including the front bumper.	_____
10.273	Apparatus body compartments, interior	Painted with light grey, scratch resistant, automotive grade paint.	_____
10.274	Chassis Frame, Axles, & Undercarriage	Painted using smooth black corrosion resistant paint. Paint Application - All paint shall be applied in accordance with the paint manufacturer's	

		recommendations. All surfaces shall be properly cleaned, prepared and primed with a suitable primer prior to painting. Painting shall have been performed in an atmosphere controlled spray booth. The cab and Aerial Ladder Platform body shall have been painted with all trim and hardware removed. All mounting holes shall have been drilled and deburred and nutserts shall be installed in blind holes prior to painting. Any caulking of body seams shall be performed prior to painting. Caulking material shall be of the highest industry standards.	_____
10.275	Paint application	All paint shall be applied in accordance with the paint manufacturer's recommendations. All surfaces shall be properly cleaned, prepared and primed with a suitable primer prior to painting. Painting shall have been performed in an atmosphere controlled spray booth. The cab and apparatus body shall have been painted with all trim and hardware removed. All mounting holes shall have been drilled and deburred and nutserts shall be installed in blind holes prior to painting. Any caulking of body seams shall be performed prior to painting. Caulking material shall be of the highest Industry standards.	_____
10.276	Reflective stripping	All reflective striping shall be 3M diamond grade striping where ever possible. The reflective striping shall be red on white and/or aluminum background and white on red background. The side striping shall be stylized Z pattern front to back of vehicle. The striping shall be composed of 5 bands. The band width shall be 10". Example: white stripe on red background. From top down shall be: one 1" white stripe, one 1' red stripe, one 6" white stripe, one 1" red stripe, one 1" white stripe. The stripes shall not be spaced apart to reveal background. The stripe shall be edge sealed as per 3M guidelines. Incorporated within the cab reflective stripe shall be stylized WFD. Cab drivers and officers door shall be location of Winnipeg Fire Department crest (size 12 ¾" x 12" wide) crest shall be within reflective stripe. Were diamond grade reflective striping is difficult to apply; series 680 reflective film shall be allowable Example: on roll up door slats. The reflective striping shall at all times meet and/or exceed NFPA 1901 as the standard guideline.	_____
		Note: The reflective striping on the cab rear entrance doors shall incorporate the Fire Department's stylized WFD' logo. (A diagram of the logo shall be provided to the Contractor by the City).	
	NOISE LEVEL		
10.277	Sound level	The sound level in the cab at all seated positions shall not exceed 80 dB(A), measured in accordance with SAE J336, with the apparatus traveling at any speed up to governed speed with the sirens off and doors and windows closed.	_____

		Bidder to provide recommendation for extra sound insulation.	
		_____	
		_____	
		_____	
10.278	**TESTING & CERTIFICATION-**	Testing - the completed vehicle shall be tested and labelled to (NFPA) National Fire Protection Association Standard latest by the manufacturer.	_____
10.279	Certification-	The contractor shall ensure the fire apparatus are designed and performance tested as per the latest NFPA 1901/1911 standards. Contractor shall provide OEM certification test results.	_____
10.280	Labelling-	A warning label shall be provided in the cab within sight of the driver stating the seating capacity of the cab/crew cab.	_____
10.281	Safety Labelling	A warning label shall be provided in the cab within sight of the driver stating the seating capacity of the cab/crew cab.	_____
10.282	Dimension Plate	A warning label shall be provided in the cab within sight of the driver stating the following vehicle dimensions: •Height and length in standard and metric measurements. •Gross vehicle weight rating in pounds and kilograms.	_____
10.283	Voltage Testing	The wiring and permanently connected devices and equipment shall be subject to a dielectric voltage withstand test of 900 volts for one minute. The testing shall be performed after all body work has been completed. The electric polarity of all permanently wired equipment, cord reels, and receptacles shall be tested to verify that wiring connections have been properly made.	_____
10.284	Fluid Capacity and Type Label	A permanent label shall be provided and shall state the type and quantity of the following fluids used in the vehicle: • Engine Oil • Engine Coolant • Chassis Transmission Fluid • Drive Axle Fluid • Pump Gear Case • Primer Lubricant (If Applicable)	_____
10.285	Vehicle Data Recorder	Meeting the requirements of NFPA 1901-2009, Vehicle Data Recorder is required. Recorded to	

		Include the following Data: • Vehicle Speed • Acceleration • Deceleration • Engine Speed • Engine Throttle Position • ABS Event • Seat Occupied Status • Seat Belt Status • Master Optical Warning Switch • Park Brake • Service Brake • Time • Date • Engine Hours	_____
10.286	Inputs	Five (5) seat position inputs for occupied and belts buckled. Additional six (6) seat expansion module available. Easily interfaces with V-MUX™ or other multiplexing systems. Data is extracted by a standard, mini USB cable.	_____
10.287	Occupant restraint indicator	Occupant Restraints designed to alert driver and officer, this module will indicate where restraints of occupied seats are properly fastened keeping personnel safe. The indicator shall be low profile compact size. Support commercial and custom cab seating layouts up to 12 seats. A dimming feature adjusts indicator intensity to synchronize with dash lights and have a built-in audible alarm.	_____
10.288	Visual Tire Pressure Monitoring	There shall be a visual six (6) wheel tire pressure system supplied that monitors all of the tires on the vehicle. An LED valve cap shall be attached to the tires valve-stem that contains a Pressure Sensor to alert the operator of a developing tire problem.	_____
10.289	Transportation Road Safety Kit	Fire Extinguisher one (1) 2.5 lb. ABC vehicle type fire extinguisher with mounting bracket.	_____
		First Aid Kit - one (1) standard First Aid Kit shall be provided.	_____
		Warning Flares - one (1) set of three (3) dual faced triangular warning flares to meet the Department of Transportation's Motor Vehicle Safety Standards.	_____
	DRAWINGS		
10.290	Two (2) sets of three (3) view drawings showing complete unit including chassis, body, compartments, tool locations, etc.	Bidders shall include drawings, within 72-hours of the request of the Contract Administrator.	_____

11.0 **WARRANTY**

11.1 All warranty information shall be detailed and include all exclusions. The successful bidder shall provide all published warranty information upon delivery of the equipment. Contractor shall State:

BODY WARRANTY

11.2	Structural	**State:**	_____
11.3	Body Vehicle basic coverage	**State:**	_____
11.4	Body compartment latches, hinges and shelving	**State:**	_____
11.5	Components e.g. Pumps	**State:**	_____
11.6	Electrical	**State:**	_____
11.7	Body Lighting	**State:**	_____
11.8	Body Paint	**State:**	_____

CAB & CHASSIS WARRANTY

11.9	Basic Vehicle - Chassis	**State:**	_____
11.10	Electrical	**State:**	_____
11.11	LED Lighting	**State:**	_____
11.12	Batteries	**State:**	_____
11.13	Drivetrain	**State:**	_____
11.14	Cab Structure/Corrosion	**State:**	_____
11.15	Frame & Cross-Members (Structural)	**State:**	_____
11.16	Frame & Cross-Members (Corrosion)	**State:**	_____
11.17	Cab Paint	**State:**	_____
11.18	Engine	**State:**	_____
11.19	Transmission	**State:**	_____
11.20	Axles - Front & Rear	**State:**	_____
11.21	Components	**State:**	_____
11.22	Warranty Literature	All warranty literature and Documentation or “fine print” documentation provided within three (3) Business Days of the	

request from the Contract Administrator. This warranty documentation will be entered into the City of Winnipeg Fire Department's Service Data Network to expedite and administrate warranty claims and repairs. _____

12.0 **DELIVERY**

12.1 Delivery Point: The complete unit shall be serviced, ready for operation and delivered F.O.B. with the freight prepaid, including invoice and N.I.V.S. (if applicable) to the WFMA 185 Tecumseh Street, Winnipeg MB. The Contractor shall be notified by the Contractor Administrator the delivery address prior to issuance of the purchase order. _____

12.2 Delivery Time: Equipment shall be delivered between 8:00 am and 2:00 pm on Business Days
State: Delivery Date _____

The apparatus purchased through this contract shall be delivered within 24-32 months. There shall be a bonus award for apparatus that can be delivered prior to delivery date. All apparatus received after the agreed upon delivery date shall be subject to a penalty that increases every month past the delivery date. _____

12.3 Delivery Contact: The Contractor shall contact the Contract Administrator prior to delivery of the equipment. _____

12.4 P.D.I: A pre-delivery inspection shall be performed by the Winnipeg Fire Paramedic Service on the Apparatus and equipment. _____

13.0 **MANUALS & OEM DIANOSTIC SOFTWARE**

13.1 Manuals supplied under this Contract shall cover the complete equipment including all components thereof; USB flash drive is preferred where available. _____

13.2 The following manuals shall be supplied with the units when delivered:

a) Operator's manual – Two (2) per unit (one operator manual shall be sent to the Winnipeg Fire Paramedic Service Training Academy 2546 McPhillips Street Winnipeg, Manitoba
Office: 204-986-8398
Fax: 204-986-4266 _____

b) Parts and service manuals – One (1) complete set including preventative maintenance schedules. USB flash drive are preferred. _____

c) OEM diagnostic software for the following systems shall be provided to WFPS: SRS and OEM multiplex software. Any other OEM software that may pertain to the maintenance and operation of the apparatus shall be noted to WFPS for future consideration. _____

TRAINING AND EDUCATION

The contractor shall provide OEM familiarization training to WFPS on the new fire apparatus. The contractor shall also be responsible to work with the WFPS Heavy Fleet Repair Shop to provide OEM level training and education on the maintenance and repair of the fire apparatus. _____

14.0 **PARTS/LABOUR AND TRAINING DISCOUNT**

14.1 Bidder to provide City of Winnipeg Parts Discount % Pricing from retail parts pricing. **State: percentage discount** _____%

14.2 Bidder to provide City of Winnipeg Labor Discount % Pricing from Retail shop labor rate. **State: percentage discount** _____%

Bidder to provide City of Winnipeg Training Discount % _____%

14.3 The Contractor shall provide a list of factory recommended lubricants to be used with the equipment, as well as a complete cross reference guide for all warranty approved lubricants and filters that can be used during preventative maintenance servicing. _____

APPENDIX #1

Listing of Equipment on WFD Engines (The purpose of this appendix is to illustrate what a typical WFD engine carries as a full equipment load. The bidder shall provide drawings of tool locations as best suited by the manufacturer. The bidder shall be responsible for the method of securing the equipment and all weight distributions. This list will not match the equipment being purchased in section 10.269/10.270 (FIRE FIGHTING EQUIPMENT) and is for compartment configurations only. _____

Cab:

1	Medeco Key/ Ace Lock Box Key (ea)
1	Panasonic Toughbook Computer
2	Sherlock Map Book
4	Portable Radios w Remote Microphones
1	Fuel Card
2	Quick Fit Sprinkler Tongs
1	Cab Jack Bar
3	Radio Headsets (in office)
1	Garbage Container
1	Seat Belt Cutter
1	CO Detector
2	Hand Sanitizers
1	Emergency Response Guide book
1	Medical Clipboard
1	Fire Alarm Clipboard / CO Detector
1	Tactical Clipboard
1	Inventory Clipboard
1	After the Fire Kit
2	Erik Kits
1	Vehicle Registration

COMPARTMENT

1	O2 Cylinder
1	K.E.D.
1	Frac Pac
1	Trauma Bag

COMPARTMENT

2	Storz to 65 mm Male
1	Storz to 65mm Female

2 65 mm Double Female Adaptors
2 65 mm Double Male Adaptors
1 Rubber Mallet
1 44mm Flake cw Akron 4820 Pistol Grip Nozzle and Reducer
1 High Pressure Kit cw High Pressure Hydrant Key, 1- 3 1/2 " Female to 4 ½ " male, 1- 3 ½ Female to 100mm Storz, 1- 65mm Male to 100 Storz
2 Hydrant Keys
4 Storz keys
2 65 mm Spanner Wrenches
3 Hose Hangers
1 65 mm Akron AssaultFog Nozzle
1 65 mm Akron Smooth bore w Tips 1 ¾", 1 3/8", & 1"
1 Turbojet Foam Nozzle
1 Cellar Nozzle
1 Socket Set
1 Set Road Deflectors (triangles)
1 65 mm Hydrant Gate
1 100mm Storz Manifold to 3- 65 mm Outlets
1 65 mm to 44 mm Gated Wye
1 Command Light Control
1 Deluge Gun Control
1 Spray Bottle R.V. Anti-freeze
2 Scene Tape (rolls)
1 Tool Box cw:Crescent wrench, Needlenose Pliers, Linesman Pliers, Waterpump Pliers, side Cutters,Cable Cutter, Utility Knife, Hacksaw c/w 3 blades, Screwdriver set, Pipe Wrench, BallPeen Hammer, Vise Grip Pliers, adjustable rubber strap wrench

COMPARTMENT

1 Piercing Nozzle
2 Water Back Packs
1 Plug N Dyke (container) & Wedges
1 Medical Bag (collars, blankets, headblocks)

COMPARTMENT

2 Sand Bags & 2 Containers of Sand
1 Sledge Hammer
1 Halligan/ Axe New York Tool
1 Axe
1 Bolt Cutter
1 Kelly Tool
1 20' Pony Length 100mm w Hyd. Adaptor
1 30' Pony Length 100mm w Hydrant Adaptor
1 50' roll 44mm Hose
1 50' Roll 44mm Hose cw Akron 4820Pistol Grip Nozzle w Reducer
1 24" Pry Bar
1 High Rise Kit

COMPARTMENT

1 Hydrant Kit w: hydrant gate, 1- Storz to 65mm Female Adaptor, 2 Storz Keys, 1- Adjustable Hydrant Key,1-Hydrant Key
1 Retractable Power Supply Box 200'
1 Heavy Gauge Electrical Cord 30'
1 Heavy Guage Electrical cord 50'
2 Sliding Female to 3 Prong Male Electical Adaptors
2 Sliding Male to 3 Prong Female Electrical Adaptors

COMPARTMENT

1 Burn Bundle / OB Kit
1 SAED/ &/ or Life Pak 12 Lead Monitor
1 O2 Therapy Kit

1 Incident Command Board/ Pas Kit
1 Universal Precautions Kit
2 Trauma Bears

COMPARTMENT

1 Foam Tank Filler Hose

COMPARTMENT

1 Hose Clamp 100mm
2 24’ Pry Bars
1 Axe
1 Dry Chemical Extinguisher
1 CO2 Extinguisher
1 Pressurized Water Extinguisher
1 Air Pump (hand)
1 Water Cooler
1 Bag w 3 Mustang Jackets and Set Throwballs
1 Rabbit Tool

COMPARTMENT

4 Tarps
1 Utility Rope (bag)

COMPARTMENT

1 PPV Fan (Battery)
2 Portable Lights w Cord Reels
1 Ground Monitor w 4 Tips
1 Little Giant Ladder
1 D-Handle Pike Pole (short) 4’

WHEEL WELL STORAGE

4 SCBA Air Cylinders

BACKBOARD COMPARTMENT

1 Spine Board w Straps, Head Bed
1 Scoop Stretcher

TOP OF PUMP

2 Corn Brooms
1 30’ Extension Ladder
1 14’ Roof Ladder
1 6’ Pike Pole
1 10’ Pike Pole
1 10’ Collapsible Attic Ladder
1 4’ Straight Lining Bar
2 Squeegees
2 Square Mouth Shovels

HOSE BED

8 100’ Lengths of 100mm Hose cw Hydrant Adaptor
8 50’ Lengths of 65mm Hose w Water Thief

FRONT BUMPER

1 Trash Line (75’) cw Nozzle

CROSS-LAY HOSE BED

2 4 -50’ Lengths 44mm Preconnected Hose c/w Nozzle
1 4 -50’ Lengths 65mm Preconnected Hose c/w Nozzle

MISCELLANEOUS

Lennox Hacksaw c/w 3 blades.
One (1) set of wheel chocks (mounted).
30 in. bolt cutter.
Two (2) combination Storz wrenches with mount.
Two (2) combination Stroz wrenches loose.
One (1) hose clamp.(manual able to accept 4 inch hose).
One (1) Honda EU2000i Portable Generator.
Two (2) Portable LED Lights c/w Cord Reels.
Four (4) Energizer Hard Case Lanterns. With batteries.
One (1) Bullard T3 truck mount battery charger.
Two (2) (50') extension cord 12/3 (20 amp twist lock plugs).
Two (2) 12" 12/3 adapter (20 amp twist lock female to 15 amp u ground male)
Two (2) 12" 12/3 adaptor (15 amp u ground female to 20 amp twist lock male.
One (1) 1 gallon RotoPax gasoline pack with built in spout.
One (1) 2 gallon RotoPax gasoline pack with built in spout.
One (1) braid on braid 150' utility rope w/ bag.
One (1) Chainsaw Stihl MS 260 c/w Wrench.
One (1) bracket for 3 Oxygen D cylinders.
Two (2) poly bush fire backpacks (folding).
One (1) Halligan Tool.