ANNEXURE C

City of Johannesburg Red Fleet Specification:

Prime Mover

8 x 4

Fire and Rescue Vehicle

Specification for 8x4 Prime Mover Fire and Rescue Vehicle.

1. GENERAL

1.1 SCOPE

1.1.1 This specification describes City of Johannesburg Red Fleet requirements for 8x4 Prime Mover Fire and Rescue vehicle.

1.2 DESIGN STANDARDS

1.2.1 The vehicle must be designed and manufactured to meet the road traffic requirements of South-Africa

1.2.2 The material selection and usage should be of the highest standard available in South Africa.

1.2.3 All body frames should be manufactured from aluminium extrusions.

1.2.4 All plating is of the highest-grade aluminium and the thickness selection is in accordance with international norms for firefighting (NFPA) vehicles.

1.2.5 The unit must be manufactured with the following material:

A. Light weight for increased power to weight ratio
B. Low maintenance
C. Corrosion resistant
D. High strength

1.2.6 The manufacturer must be registered with, Manufacturer, Importer and Builder (MIB) of fire engines and with the South African Bureau of Standards (SABS Capability Report)

1.2.7 The manufacturer must comply with ISO 9001:2008 quality certified manufacturer

1.2.8 The unit manufactured must comply fully with the National Road Traffic Act 93 of 1996 as amended, SABS Compulsory and CKS 928 Specifications.

1.2.9 The complete apparatus shall be homologated prior to delivery to the end user.

1.3 COMPLIANCE TO NFPA

1.3.1 The vehicle will be tested by the manufacturer that it is in accordance with NFPA 1901: Standard for Automotive Apparatus (2016 edition) including pumps and certification to be provided.

1.4 FACTORY ACCEPTANCE TEST

1.4.1 Before delivery of the vehicle, the following factory acceptance tests shall be conducted by nominated City of Johannesburg:

Vehicle:

A. Electrical system performance testing
B. Weld quality
C. Alternator performance test

D. Dimension Check
E. Brake Test
F. Turning diameter
G. Weight measurement, full load and empty.
H. Road Test, including acceleration, top speed test and cooling system

Firefighting:

I. Primer test
J. Pump flow test
K. Piping Hydrostatic pump test
L. Water tank to pump flow test
M. Water tank and foam tank tests
N. Power train testing
O. Superstructure integrity test
P. Complete operational test
Q. Foam system test
R. Emergency lighting system test
S. Dry vacuum test.

1.4.2 All products should undergo a quality assurance program and be fully inspected for compliance to specifications.

1.4.3 Travelling local and international for Factory Acceptance Test shall be at cost of successful bidder.

1.4.5 All relevant certification of the products shall be provided before the test.

1.4.6 All products must undergo a quality assurance program and be fully inspected for compliance to specifications.

1.5 **WARRANTY**

1.5.5 The service provider will be responsible for the warranty of the complete vehicle irrespective of the components. All warranty and related calls will be logged with the service provider/s.

1.5.6 The overall warranty period on the apparatus superstructure must be at the minimum standard of five years (5) from the date of delivery.

1.5.7 The minimum five (5) years warranty for the following unit must apply with the exclusion of the chassis cab and water tank warranty must be minimum of 10 years.

A. Structural Integrity Warranty
B. Power Train
C. Transmission
D. Painting
E. Plumbing
F. Fire Pump

1.5.8 All components and spares utilised in the manufacturing process must be approved by the Original Equipment Manufacturer (OEM).

1.5.9 All defects encountered due to poor workmanship and manufacturing deficiencies will be replaced at the cost-of-service provider/s during the warrantee period.

1.6 FREE SERVICE/ INSPECTION

1.6.5 A Pre -Delivery (PDS) and 1st Inspection service will be undertaken prior to delivery.

1.7 TRAINING AND SKILL TRANSFER

1.7.5 Training will be provided free of charge, on-site for sixty (60) personnel members, by professionals and will be based on the following:

A. Driving Techniques
B. Fire Fighter Safety
C. Operating Instructions - Warrior
D. Water & Foam Supply Systems
E. Pumping Operations & Techniques
F. Basic Vehicle Care & Preventative Maintenance
G. Basic Equipment Care & Preventative Maintenance
H. Basic Vehicle & Equipment Specifications

1.8 LICENSING & REGISTRATION

1.8.5 The vehicle shall be register and licence as per the City of Johannesburg Emergency Medical Services (COJEMS) requirements, and the cost will be included on the price of the unit.

2 FUNCTIONAL SPECIFICATION FOR PRIME MOVER FIRE AND RESCUE APPARATUS

2.4 GENERAL

2.4.5 Vehicle Description

Table A

No	Description	Comment
1	Product class	Truck
2	Chassis adaptation	Basic
3	Wheel configuration	8x2, 4-axle vehicle with drive on two rear axles
4	Transportation application	Fire and Rescue

2.4.6 Dimensions

Table B

No	Description	Comment
1	Axle distance	Not less than 5900 mm
2	Dimension JA	Not less than 2470 mm
3	Chassis width	Not less than 2600 mm

2.4.7 Weights

Table C

No	Description	Comment
1	Legal weight front axle	Not less than 7700 kg
2	Legal weight 1st rear axle	Not less than 9000 kg
3	Legal GVW	Not less than 33500 kg
4	GCM Legal	Not less than 74000 kg
5	Techn. gross vehicle.weight (GVW)	Not less than 44000 kg
6	GCM Technical (kg)	Not less than 78000 kg
7	Gross train weight, technical	77001-78000kg
8	GTW actual	Not less than 56000-60000 Kg

2.4.8 Number Plates

Table D

No	Description	Comment
1	Plate language (As per National Road Traffic Act	English

2.4.9 Engine

Table E

No	Description	Comment
1	Fuel	Diesel
2	Engine stroke volume	13 litres
3	Engine Type	six cylinder in line Cubic capacity not less than 12.7 dm3 Output not less than 1900 rpm, 410 hp (302 kW) Maximum torque at 1000-1350 rpm, 2000 Nm Injection system (unit injector PDE emission level)
4	Turbocharger duty class	Special
5	Crankcase ventilation, type	Open
6	Crankcase gas cleaning type	filter
7	Powertrain oil type	normal
8	White smoke limiter	normal
9	Air intake	front, normal
10	Air cleaner safety filter	standard

2.4.10 Engine PTO

Table F

No	Description	Comment
1	PTO ED electrical preparation	with 1 circuit
2	Power Take-Off Engine Driven (ED)	ED 120P

2.4.11 Cooling System

Table G

No	Description	Comment
1	Fan control	electronic
2	Fan Blade quality	11
3	Fan, gear ratio	1:1

2.4.12 Fuel System

Table H

No	Description	Comment
1	Fuel tank mounting	single tank
2	Fuel Tank	Not less than 300-litre tank in aluminium/steel
3	Fuel Tank Location	Right hand side
4	Fuel cap	1 piece lockable

2.4.13 Exhaust System

Table I

No	Description	Comment
1	Exhaust silencer execution	cube
2	Exhaust outlet, direction	Right hand side
3	Exhaust silencer heat cover	normal

2.4.14 Gearbox

Table J

No	Description	Comment
1	Gearbox type	Automatic
2	Gears	six speed fully automatic gearbox with two driving programmes and integrated retarder.

3	ECU automatic gearbox	the gearbox control unit should be adapted for emergency and rescue vehicle
4	Propeller shaft	with propeller shaft protection strap

2.4.15 Axles

Front

Table K

No	Description	Comment
1	Front axle type	AM901
2	Axle weight front, technical	2x not less than 9000 kg
3	Shock absorber setting front axle	Comfort

Rear

Table L

No	Description	Comment
1	Bogie distance	Not less than 1350 mm
2	Bogie weight, technical	Not less than 26000 kg (13000+13000)
3	Rear axle gear ratio	Not less than 4.88
4	Differential lock	Standard
5	Differential lock	Standard

Wheels

Rims

Table M

No	Description	Comment
1	Wheel, type	disc
2	Rim material	Steel
	Rim quantity front axle(s)	four
3	Rim type size material front axle(s)	Not less than 11.75 disc
4	Rim quantity rear axle	four
5	Rim type size material second rear axle	Not less than 9.00 disc
6	Rim quantity second rear axle	Four

7	Rim type size material second rear axle	Not less than 9.00-22.5 disc
8	Rim quantity spare	one
9	Rim	Not less than 9.00-22.5 disc
10	Wheel, type	disc

2.4.16 Tyres

Table O

No	Description	Comment
1	Tyre size	385/65 R22.5
2	Wheel nut cover	painted 2 axles, steel
3	Wheel chock	two pieces

2.4.17 Brakes

Table P

No	Description	Comment
1	APS intelligent compressor	air management high capacity
2	Brake adaptation	rigid
3	Wheel brake	drum (brake drum and shoes with well protected components)
4	Brake control combination	pneumatic
5	Brake control	pneumatic
6	ABS. Anti-lock brakes	the ABS should distribute the braking force between the different wheels of the vehicle and prevents any of the wheels locking during braking.

2.4.18 Traction Control

Table Q

No	Description	Comment
1	Retarder	Automatic
2	Exhaust brake control	Automatic

2.4.19 Suspension

Table R

Front

No	Description	Comment
1	Suspension system	leaf
2	Suspension leaf springs	4 x 28 Parabolic

2.4.20 Suspension

Table S

Rear

No	Description	Comment
1	Suspension system	leaf
2	Suspension leaf springs	4 x 28 Parabolic

2.4.21 Steering

Table T

No	Description	Comment
1	Steering position	right hand
2	Steering system	1-circuit
3	Adjustable steering wheel	

2.4.22 Power Supply

Table U

Electrics

No	Description	Comment
1	Battery	180 Ah, 2 x 12V batteries in series for 24v
2	Alternator charge	150 A (A powerful 150A alternator that produces 86A straight away at idling speed should be also available.
3	Brake control	Electronic double acting switch on the battery box dashboard, which switches off the connection to one of the battery terminals, and this way the whole vehicle should be de-energised, apart from the Vehicle Management Technology (VMT).

2.2 Cab

Table V

No	Description	Comment
1	Design	A short cab with low roof with space for two people. Wide and practical boarding step units make it easy to enter and exit the cab. The cab should be designed as a large safety cage around the driver and passenger so that they are well protected.
2	Upholstery	All seats upholstery must be in black leather, dirt repellent and easy to clean.
	Warning signal for unconnected seat belts	Lamp and audio signals (and shall warns an unbelted driver with an acoustic signal and a warning lamp when speed exceeds a minimum of 25 km/h.)
3	Design	A short cab with low roof with space for two people. Wide and practical boarding step units make it easy to enter and exit the cab. The cab should be designed as a large safety cage around the driver and passenger so that they are well protected.

Table X

Cab Exterior

No	Description	Comment
1	Cab suspension	4-point air sprunged
2	Cab anti-roll bar	comfort
3	Cab tilting	Manual and Automatic

2.3 Accessories

Table Y

No	Description	Comment
1	Vehicle first aid kit, as per Government regulation 7 Occupational Health and Safety Act (OHSA) 85 of 1993	Compulsory

2	Triangle	Compulsory
3	Fire extinguisher	1 x 2 kg Dry Chemical Powder
	Reverse alarm audible inside and outside	Compulsory

2.4 Extended Front Bumper

2.4.1 The front bumper shall be extended 400mm from the front of the vehicle cab. This extension shall allow for the fitment of the winch directly fitted to the chassis in line of the weight capacity of the winch

2.5 Sight Rods

2.5.1 Sight rods, one either side, shall be fitted to the extended front bumper.

2.6 Tow Hooks

2.6.1 Two (2) stainless steel chromed spring loaded self-locking tow hooks shall be mounted and fitted to the chassis assembly through the front extended bumper

2.7 Winch

2.7.1 A 10000 kg electric reversible winch with a suitable rated cable and a replaceable clevis hook shall be mounted to the chassis frame extension centred at front bumper area, and shall be controlled with a 2.9m remote control switch. A winch accessory kit to be supplied (snatch block, kinetic straps and u- bolts rated for the winch weight).

2.8 Dual Air Horns

2.8.1 Dual air horns shall be provided and connected to the chassis air system. The horns shall be mounted below the side of the front bumper on each side. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure. The air horn control shall be placed at the left foot of the driver.

2.8.2 Windows and mirrors

Table Z

No	**Description**	**Comment**
1	Windscreen	tinted (top part)
2	Door windows	single glazed with smash and grab film.
3	Window winder door	mechanical or automatic
4	Rear view mirror type driver	spherical
5	Rear view mirror type passenger	spherical

2.8.3 Lock and Alarm

Table AA

No	Description	Comment
1	Number of keys/remotes	Two

2.8.4 Cab Interior

Table BB

No	Description	Comment
1	Wall panel/headlining material	vinyl
2	Door panels	plastic
3	Sun visor	foldable
4	Interior lighting	The background lighting should comprise of red LED's integrated in the dome lamps, the lighting under the instruments panel and the boarding step**.**
5	Protection mats floor	rubber
6	Gear selector position	Steering wheel column or left side of the driver's seat.

2.8.5 Seats

Table CC

No	Description	Comment
1	Upholstery seat	vinyl
2	Seat belts	Red in colour for both the drive and the

2.8.6 Climate system

Table DD

No	Description	Comment
1	Climate system control	Must be manual
2	Air conditioning	Yes

2.9 Dash mount Radio.

2.9.1 The apparatus must have a provision for the dash mount two-way radio.

2.10 Dash mounted GPS.

The vehicle shall have a GPS mounted on the dashboard.

2.10.1 Dimension 9.2" x 6.4" x 3" (23.3 x 16.2 x 7.6 cm)

2.10.2 The device shall have touchscreen capabilities

2.10.3 The display size shall be not less than 7.8" x 4.4"; 9.0" diagonal (19.9 x 11.2 cm; 22.9 cm diagonal)

2.10.4 Display resolution shall not less than 1280 x 720 pixels

2.10.5 Display type shall be WXGA

2.10.6 Minimum 1.6 kg

2.10.7 Water rating shall not be less than ipx7

2.10.8 Maps & memory shall accept data cards 2 micro SD cards (back of unit), have a minimum of five (5) waypoints, a minimum of 50 track points, and have a minimum of 100 track routes.

2.10.9 Sensors must have a built-in receiver with a minimum of Ten (10) hz high-sensitivity, NMEA 2000 compatibility, NMEA 0183 compatibility and supports WAAS

2.10.10 The unit shall have built-in maps -in auto guidance, bluechart (coastal), lakevu (inland)

2.10.11 The unit connections shall have one NMEA 2000 ports, NMEA 0183

2.10.12 Input ports, NMEA 0183 input (TX) ports, video input ports, BNC j1939 ports , marine network ports, 12-pin transducer ports, USB port, BNC external GPS antenna port. Bluetooth, ant+ (connectivity), Wi-Fi network (local connection)

2.10.13 The unit shall have an electrical power input between 10 to 32 VDC at typical current draw at 12 VDC 1.37, maximum power usage at 10 VDC 40.2W

2.11 *Vehicle Camera System*

2.9.1 It must have rear view camera.

2.9.2 The camera image/s must be displayed on the driver's full colour Mux display. The camera must be able to operate in the dark/night and over exposed lighting.

2.9.3 Cab Accessories

Table EE

No	Description	**Comment**
1	Hose for tyre inflation	20 metres
2	Jack	Yes
3	Fire extinguisher	1 x 2kg Dry Chemical Powder (DCP)
4	Safety triangles	Two
5	Tool case	Yes
6	Operator’s manual	One copy in English

2.9.4 Water Tank Module

Table FF

No	Description	Comment
1	Design	Grade 316 stainless steel oval tank module
2	Capacity	Not less than 8000 litres
3	Tank dimensions	Not less than 1996mm x 1287mm
4	Size	300mm x 300mm tower
5	Type	Mild steel cat walk
6	Dimensions	76mm x 38mm mild steel base hook frame
7	Hose trays	2 x Aluminium hose trays, one mounted on each side of the tank L4065 x B225 x H225mm
8	Equipment compartments	2 x Aluminium equipment boxes, one (1) mounted on each side L1900mm x B225mm x H450mm fitted with roller shutter doors
9	Tank fill	Female 65mm NST with open/close ball valve
	Bed Design	Stainless steel
	Bed dimensions	L6256mm x B2456mm H500mm

2.10 CRANE

2.10.1 Lifting moment – Not less than 753,4kNm (76,8mt)

2.10.2 Specifications according to - EN12999:2011 or equivalent standard

2.10.3 Hydraulic outreach – Not less than11.3m

2.10.4 High extension speed

2.10.5 Maintenance free boom system

2.10.6 Internally routed hoses between main boom and knuckle boom

2.10.7 Endless slewing angle

2.10.8 Stabilizer Ram 180° hydraulic tiltable.

2.10.9 Paltronic 50 overload protection and emergency cut-off

2.10.10 Slew angle dependant lifting capacity limitation (SHB)

2.10.11 Active oscillation suppression (AOS)

2.10.12 Electronic High Power Lifting System (HPLS) – control unit

2.10.13 Radio remote control with control valve

2.10.14 Hydraulic oil tank 400 litre (TKKR)

2.10.15 LH15.0 15000kg - load hook with roller bearing

2.10.16 Linear levers – 4 element control valve

2.10.17 6 Function radio remote control, prepared on/off functions on handset

2.10.18 Display for load percentage and overload on handset

2.10.19 Emergency control on the crane column with functional cover

2.10.20 Hydraulic telescopic outriggers on both sides

2.10.21 Stabilizer spread

2.10.22 Warning lights on the stabilizers

2.10.23 10° tiltable stabilizer plates

2.10.24 Oil cooler

2.10.25 High pressure filter

2.10.26 Digital hour meter with indication of service intervals

2.10.27 Total mass – 7510kg

2.10.28 Minimum lifting space required – 1800mm

2.10.29 Flat Bed

Table GG

No	Description	**Comment**
1	Design	Stainless steel
2	Bed dimensions	L6256mm x B2456mm H500mm
3	Size	300mm x 300mm tower

2.11 SIREN AND STARBAR AND ROTATERS

2.11.1 A minimum of 100W siren system must be provided and mounted inside the cab within easy access of the officer. The system must have the following features:

A. Compact, feature-packed, high powered

B. Automatic selection of emergency lights when any tone is selected.

C. Wail and Yelp siren tones as defined in the Road Traffic Act with Stenner tone for intersections.

D. Air horn tone activated by hooter button when no siren tone is selected.

E. Siren sound pressure level with HD110R driver system exceeds minimum of 123dB and P.A. level exceeds minimum of 115dB.

F. PTT switch on microphone allows for siren tone over-ride when selected.

2.12 PORTABLE FIRE FIGHTING PUMP

A. Maximum output at 10 bars not less than 1700l/min

B. Maximum flow not less than 2450l/min @ 3 bar

C. Maximum pump discharge pressure not less than 16.3 bars

D. Maximum pump speed not less than 6100 rpm

E. Priming time to 7.5M with 100mm suction line not more than 30 seconds

F. Dimensions LxWxH – 677mm x 525mm x 620mm

G. Coolant capacity 4 litres

H. Oil capacity 3 litres

I. Fuel tank capacity not less than 18 litres

J. Fuel type Petrol

K. Engine 2 Cylinder, 4 stroke

L. Engine capability 52kW (70 HP) @ 7500 rpm

M. Capacity Not less than 850cc

2.80 Auxiliary Equipment

Item no.	Item description	Equipment specification
1	20 x Hose Adaptors	• Must be made out of cast aluminum • Must be female 65mm BIC to female 65mm NST coupling • Must be male 65mm BIC to male 65mm NST coupling • must be male 65mm BIC to male 38mm NST • must be male 65mm NST to 65mm NST • Must be female 65mm NST to male 38mm NST
2	2 x Standpipes (key and bar)	• Must be made out of Steel alloy • Must be at a maximum of 1m and 1.5m long • The swivel head must be 65mm diameter Female instantaneous • Must fit the London V thread (LVT) 65 mm • London Round Thread to London V thread adaptor to standpipe with a 5mm steel cable • Must be supplied with key and bar
3	2 x Hydrant wheels	• It must be constructed from Aluminum Alloy • Minimum Dimension: Diameter 150mm, Thickness 20mm • Finishing must be red powder coated • Must indicate close and open directions •

4	2 x Hydrant keys (X shape)	• Must be made out of Stainless steel. • Must be wheel spanner shape •
5	6 x 65mm double jacket fire hoses (NST coupling)	• Must have National Standard Thread • Minimum 30 Meter • Must be double jacketed • Must be Canvas Hose • Must have 100% Synthetic high tensile all polyester double jacket • Must have 100% Mildew resistant • Must be single-ply synthetic polyurethane liner resists ozone • Reduced weight, • Increased flexibility • Must be tested and stenciled in accordance with NFPA Standard 1961 • Must have minimum one year warranty for manufacturing defects and delamination
6	3 x 100mm double jacket fire hoses (NST coupling)	• Must be a Storz Couplings • Must be 15 Meter long • Must be Double Jacketed • Must be Canvas Hose • Must be 100% Synthetic high tensile all polyester double jacket • Must be single-ply synthetic polyurethane liner resists ozone • Must mildew resistant • It must be lightweight • It must have an increased flexibility • It must be tested and stenciled in accordance with NFPA Standard
7	2 x High volume hose spanner	• Must fit 100mm Storz Couplings and 65mm NST Couplings •
8	1 x Goose neck	• must be made out of cast aluminum • must be from 100mm Stortz to 65mm male BIC
9	1 x 65mm collecting breeching	• Must be made out of Lightweight aluminum alloy • Must have 2 x 65mm NST female inlets

		• Must have a self-locking valve for positive handle positioning. • 1 x 65mm NST Male outlet •
10	2 x 65mm hose ramps	• Bridges must give you economical hose line protection for up to 65mm hose lines. • It must be not less than 30cm wide and can be interlocked to any width • Must be equipped with reflective safety strips for added visibility. • Must be made of fiber reinforced rubber. • Must accommodate two hoses.
11	1x dividing breech	• Must have 65mm NST female inlet • 2 x 65mm NST male outlets • Must be made of hard anodized metal • It must have an Aluminum Shut off valves with high tensile control handles • It must have Self-locking valves for positive handle positioning • It must have a minimum weight of 7 Kg • Must be flow efficient at a minimum of 2400L/min through each valve.
12	2 x Stabilizer plates	• manufactured from stainless steel • 500mm x 500mm with 2 handles • 10mm thickness
13	Equipment compartment	