

## **ANNEXURE A**

### **City of Johannesburg Fire and Rescue Vehicle Specification**

## **Specification**

### **1. GENERAL**

#### **1.1 SCOPE**

- 1.1.1 This specification describes City of Johannesburg 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 lightweight material.
- 1.2.4 All plating is of the highest-grade lightweight material and the thickness selection is in accordance with international norms for firefighting (NFPA or equivalent standards) vehicles.
- 1.2.5 The vehicle must be made of 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 Bidder and/or the manufacturer and/or the Importer and/or the Builder (as the case may be) must be registered as a Manufacturer, Importer or Builder (MIB) with the Department of Transport.
- 1.2.7 The vehicle must comply fully with the National Road Traffic Act 93 of 1996 as amended.
- 1.2.8 The complete vehicle shall be homologated prior to delivery to the end user.

#### **1.3 COMPLIANCE TO NFPA AND TESTING FACILITY**

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

#### **1.4 TESTING**

- 1.4.1 The bidder must provide documentary proof that the following tests have been performed:
- A. Electrical system performance testing

- B. Weld quality
- C. Alternator performance test
- D. Primer test
- E. Pump flow test
- F. Water tank to pump flow test
- G. Water tank and foam tank tests
- H. Power train testing
- I. Superstructure integrity test
- J. Paint sample test
- K. Complete operational test
- L. Foam system test
- M. Emergency lighting system test

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

## 1.5 WARRANTY

- 1.5.1 The bidder shall be responsible for the warranty of the complete vehicle irrespective of the components. All warranty and related calls will be logged with the bidder/s.
- 1.5.2 The overall warranty period on the apparatus superstructure must be at the minimum standard of five years (5) from the date of delivery.

The minimum five (5) years warranty for the following items:

- A. Structural Integrity Warranty
  - B. Power Train
  - C. Transmission
  - D. Painting
  - E. Plumbing
  - F. Fire Pump
- 1.5.3 The chassis cab and water tank warranty must be a minimum of 10 years.
- 1.5.4 All components and spares utilised in the manufacturing process must be approved by the Original Equipment Manufacturer (OEM).
- 1.5.5 All defects due to poor workmanship and manufacturing deficiencies will be replaced at the cost of bidder/s during the warrantee period.

## 1.6 FREE SERVICE/ INSPECTION

- 1.6.1 A Pre -Delivery (PDS) and 1<sup>st</sup> Inspection service will be undertaken prior to delivery.

## 1.7 TRAINING AND SKILL TRANSFER

- 1.7.1 Training will be provided by the bidder free of charge, on-site for sixty (60) personnel members, by professionals and will be based on the following:
- A. Vehicle specific driving techniques
  - B. Fire Fighter Safety
  - C. Operating Instructions
  - 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

- 1.8.1 The vehicle must be registered and licenced within the jurisdiction of the City of Johannesburg and the cost shall be included in the price of the vehicle.

## 2 FUNCTIONAL SPECIFICATION FOR A FIRE AND RESCUE VEHICLE

### 2.1 CHASSIS CAB

- 2.1.1 Fire and Rescue vehicle must be on a double cab chassis.
- 2.1.2 Spare parts must be readily available in South Africa.
- 2.1.3 Drive Configuration: 4x2

### 2.2 ENGINE GOVERNOR

- 2.2.1 The engine must be governed to a maximum speed of 110 km/h on a flat surface.

### 2.3 ENGINE HOUR METER

- 2.3.1 An engine hour meter must be fitted in the vehicle.

### 2.4 CREW SEATING

- 2.4.1 The standard seating in the cab must be a minimum of five persons including the driver.

### 2.5 MASTER SWITCH

- 2.5.1 A battery master switch must be provided that shall isolate power to the batteries.

### 2.6 GENERAL

#### 2.6.1 Vehicle Description

Table A

No	Description	Comment
1	Product class	Truck

<b>2</b>	Chassis adaptation	Basic
<b>3</b>	Wheel configuration	4x2, 2-axle vehicle with drive on one rear axles
<b>4</b>	Duty class	High
<b>5</b>	Chassis height	High

### 2.6.2 Engine

**Table B**

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Fuel	Diesel
<b>2</b>	Engine stroke volume	13 litres
<b>3</b>	Engine type, vehicle	minimum 220Kw - 310 kW Euro-3
		Diesel engine, six-cylinder
		Max. output at 1900 rpm: between 350-420 hp
		Max. torque at 1000-1350 rpm: 2000 Nm
<b>7</b>	Emission level	Euro 3

### 2.6.3 Cooling System

**Table C**

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Fan control	electronic
<b>2</b>	Fan, gear ratio	1:1

### 2.6.4 Fuel System

**Table D**

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Fuel tank mounting	Single/double tank
<b>2</b>	Fuel tank capacity	Not less than 300-litre tank in aluminium/steel

<b>3</b>	Fuel cap	lockable
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## 2.6.5 Exhaust System

Table E

No	Description	Comment
<b>1</b>	Exhaust outlet, direction	Either top, side or rear

## 2.6.6 Gearbox

2.6.6.1 Automatic gearbox (minimum of 5-speed fully automatic with integrated retarder)

## 2.6.7 Power Take Off (PTO)

Table F

No	Description	Comment
<b>1</b>	EG-power take off	compulsory

## 2.6.8 Axles

### Front

Table G

No	Description	Comment
<b>1</b>	Axle weight front, technical	Minimum 8500 kg

### Rear

Table H

No	Description	Comment
<b>1</b>	Bogie weight, technical	Minimum 11000kg
<b>2</b>	Differential lock	compulsory

## 2.6.11 Wheels

### Rims

Table I

No	Description	Comment
<b>1</b>	Wheel, type	disc
<b>2</b>	Rim material	steel/Aluminium

<b>3</b>	Rim quantity front axle(s)	2
<b>4</b>	Rim quantity rear axle	4

### 2.6.9 Brakes

Table J

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	ABS intelligent compressor	air management
<b>2</b>	Wheel brake	Drum and shoes
<b>3</b>	Brake control combination	Pneumatic/Hydraulic
<b>4</b>	Brake control	Pneumatic/Hydraulic
<b>5</b>	ABS, Anti-lock brakes	compulsory
<b>6</b>	Slack adjuster	Automatic (2-axle)
<b>7</b>	Retarder	compulsory
<b>8</b>	Exhaust brake control	Manual/automatic

### 2.6.10 Steering

Table K

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Steering wheel position	Right hand side
<b>2</b>	Steering system	1-circuit
<b>3</b>	Adjustable steering wheel	compulsory
<b>4</b>	Steering wheel air bag	compulsory

### 2.6.11 Power Supply

Table L

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Battery	Minimum of 180 Ah, 2x12 V batteries in series for 24 V

<b>2</b>	Battery security	On Lockable
<b>3</b>	Alternator charge	Must be a minimum of 150A alternator that produces minimum 86A at the idling speed.

2.6.12 All vehicle electronic components and lights must be powered from the 24 volts battery.

## **2.7 Battery connection bodybuilder**

2.7.1 Must have a fuse box with dimensions for maximum 200 A.

## **2.8 Cable harness additional switches**

2.8.1 The dashboard must be prepared with wiring for a minimum of 2 extra switches.

## **2.9 Instruments**

Table M

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Instrument panel finish	treated
<b>2</b>	Instrument panel colour	Black/Grey
<b>3</b>	Underskirt instruments panel colour	Black/Grey
<b>4</b>	Instrument cluster	Basic, km/h
<b>5</b>	Air pressure display	Bars/psi

## **2.10 Communications**

2.10.1 The vehicle must be fitted with a Two- way radio in the cab.

## **2.11 Cab**

Table N

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Cab Type	Double cab must accommodate a minimum of 5 persons (including the driver)



### 2.11.1 Cab exterior

Table O

No	Description	Comment
1	Cab suspension	2-point air sprung
2	Cab anti-roll bar	Comfort
3	Cab tilting	automatic/manual
4	Signal horn	compressed air
5	Boarding step front, foldable	the folding boarding step must be secured in the front edge and fitted in the bumper.
9	Front mudguard	Must be provided
10	Splash guard, front	Must be provided

### 2.11.2 Windows and mirrors

Table P

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	Must be provided
5	Rear view mirror type passenger	Must be provided

### 2.11.3 Cab interior

Table Q

No	Description	Comment
1	Wall panel/headlining material	Any material which is dirt repellent and easy to clean.
2	Door panel	Any material which is dirt repellent and easy to clean.
3	Sun visors	Foldable

<b>4</b>	Interior lighting	<ol style="list-style-type: none"> <li>1. Must have Lamps in the roof shelf.</li> <li>2. Must have Reading lamps.</li> <li>3. Must have the lighting under the instrument panel and the boarding step lighting.</li> <li>4. Must Switch off and on via a separate switch.</li> </ol>
<b>5</b>	Gear selector position	Must be located in the suitable position where a driver can easily reach.
<b>6</b>	Protective mats floor	Must be non-slippery rubber

#### 2.11.4 Seats

Table R

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Driver seat	must be adjustable for legroom and height, equipped with adjustable backrest, with integrated head restraint and integrated safety belt.
<b>2</b>	Passenger seat	must have several setting options, which can be moved backward and forward, raised, and lowered, and has an adjustable backrest with integrated head restraint. The seat must have an integrated safety belt.
<b>3</b>	Crew seat lay out	The seat must have a provision of the Self-Contained Breathing Apparatus (SCBA) storage
<b>4</b>	Upholstery	All seats upholstery must be in any material which is dirt repellent and easy to clean.

#### 2.11.5 Climate system

Table S

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>1</b>	Climate control	Must be provided

<b>2</b>	Air conditioning	Must be provided
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### 2.11.6 Illumination

Table T

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>4</b>	Headlamp protection	Compulsory
<b>5</b>	End outline marker lamp	Clear
<b>6</b>	Beacon lights	Compulsory
<b>7</b>	Tail lamp position	on bracket
<b>8</b>	Fog lamp, rear	compulsory

### 2.11.7 Accessories

Table U

<b>No</b>	<b>Description</b>	<b>Comment</b>
<b>2</b>	Vehicle first aid kit, as per Government regulation 7 OHS act	Compulsory
<b>3</b>	Triangle	Compulsory
<b>4</b>	Fire extinguisher	1 x 2 kg
<b>5</b>	Reverse alarm audible inside and outside	Compulsory
<b>6</b>	Tool Case	1. Jack 2. Wheel Spanner

### 2.11.8 Crew and passenger seats

2.12.9.1 Provision must be made for SCBA storage brackets on the back rest of all seats excluding the driver seat.

2.12.9.2 The incorporation of the SCBA brackets in the back rests must allow for the immediate donning.

2.12.9.3 The SCBA seat must have dual padded extensions to ensure the comfort for all the passengers whilst travelling.

2.12.9.4 The SCBA retaining bracket must be fitted with a quick release strap to allow the SCBA set to be easily released for quick donning.

2.12.9.5 The bracket must be capable of containing the SCBA set when force is applied.

#### **2.11.9 Vehicle Camera System**

2.11.9.2 The vehicle must have a rear view camera.

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

#### **2.11.10 Bulbar**

2.11.10.2 Must be a chromed bulbar mounted to the chassis frame.

### **2.12 Deck Gun/Monitor**

2.14.1 The pump panel must include all electric 12 VDC controls.

2.14.2 The Deck gun must include the automatic stow feature.

2.14.3 A remote control must be installed on the pump operator's panel and a wireless radio remote.

2.14.4 The Deck gun must match the colour of the vehicles.

2.14.5 The Deck gun must be mounted between the pump panel and the cab in the most convenient position allowing for maximum operation with no restrictions.

### **2.13 Nozzle**

2.15.1 An electronic controlled select automatic master stream nozzle must be provided.

2.15.2 The deluge riser must have a male National Standard Threads for mounting the monitor.

### **2.14 Pump System**

2.17.1 The pump must be a mid-ship/ rear mounted single stage centrifugal pump. The pump must be mounted on the chassis frame rails and must be power take off (PTO) driven.

2.17.1 Suction port/s with a diameter between 100mm to 155mm and suitable NST male threads and removable screens must be provided on either side.

2.17.2 Inlets must come equipped with long handle chrome caps.

## **2.15 Pressure Relief Valve**

2.15.1 The pump must be equipped with an automatic/manual pressure control device. A single bronze variable pressure setting relief valve must be provided and be of ample capacity to prevent an undue pressure rise as outlined in N.F.P.A 1901.

2.15.2 The relief valve must be normally closed and must open against pump pressure. A relief valve control wheel with a control light to signal when open must be mounted on the pump operator's panel.

## **2.16 Discharge Manifold**

2.16.1 The pump system must utilize a stainless-steel/chrome discharge manifold system that allows a direct flow of water to discharge valves.

2.16.2 The manifold and fabricated piping systems must be constructed with a corrosion resistant material.

## **2.17 Primer System**

2.17.1 The electronic driven priming pump must be a positive displacement vane type. One (1) priming control, located at the pump operator's position, must open the priming valve and start the priming motor.

2.17.2 The primer must be oil-less type.

2.17.3 The priming valve must be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

## **2.18 Pressure Gauge System**

2.18.1 The vehicle must be fitted with Suction and Discharge gauges on the pump panel.

2.18.2 A throttle must be mounted on the pump operator's panel and must be used to control the engine RPM.

2.18.3 A master drain valve must be installed and operated from the pump operator's panel.

## **2.19 Pressure Governor**

2.19.1 The vehicle must be fitted with a "Total Pressure Governor" engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine.

2.19.2 The "Total Pressure Governor" is to operate as a pressure sensor (regulating) governor (PSG).

2.19.3 A special pre-set feature must permit a predetermined pressure or RPM to be set.

2.19.4 The pre-set pressure or RPM must be displayed on the message display of the "Total Pressure Governor".

2.19.5 The pre-set must be easily adjustable by the operator.

- 2.19.6 The pressure sensor governor system must be operable only after the vehicle parking brake has been set, the transmission is on the pumping mode, and the fire pump has been engaged.
- 2.19.7 The pressure sensor governor system must have two (2) modes of operation: pressure mode or rpm mode.
- 2.19.8 When in the pressure mode, the PSG system must automatically maintain the discharge pressure set by the operator regardless of flow (within engine/pump operating capabilities).
- 2.19.9 In the RPM mode, the PSG system will automatically maintain a set engine speed, regardless of engine load (within engine operation capabilities).
- 2.19.10 A pump cavitation protection feature will be provided which must return the engine to idle should the pump cavitate.
- 2.19.11 The pressure controller must incorporate monitoring for engine coolant temperature, oil pressure, and battery voltage.

## **2.20 Auxiliary Engine Cooler**

- 2.20.1 An engine cooler used to lower engine water temperature during prolonged pumping operations and controlled at the pump operator's panel must be provided.
- 2.20.2 The engine cooler must be installed in the engine coolant system in such a manner as to allow cool pump water to circulate around engine water, thus forming a true heat exchanger action.
- 2.20.3 Cooler inlet and outlet must be continuous, preventing intermixing of engine coolant and pump water.

## **2.21 Pump Cooler**

- 2.21.1 The pump must have a minimum 10mm line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. The pump cooler line must be controlled from the pump operator's panel.

## **2.22 Firefighting Pump**

- 2.22.1 The minimum of 2800 l/min pump must be fitted and be capable of taking suction and discharging water in accordance with current NFPA 1901: Standard for Automotive Fire apparatus (2016 edition) or equivalent standards.
- 2.22.2 The pump must be tested at the manufacturer's facility by an independent, third-party testing service. The bidder must provide a documentary proof of such tests.
- 2.22.3 The conditions of the pump test must be as outlined in current NFPA 1901: Standard for Automotive Fire Apparatus (2016 edition) or equivalent standards.

2.22.4 The tests must include, a minimum but not limited to the following as outlined in current NFPA 1901: Standard for Automotive Fire apparatus (2016 edition) or equivalent standards:

- A. The pumping engine overload test
- B. The pressure control system test
- C. The priming device tests
- D. The vacuum test
- E. The water tank to pump flow test
- F. A plumbing hydrostatic test

The bidder must provide a documentary proof of such tests.

## **2.23 Water Tank Level Gauge**

2.23.1 One (1) electronic/manual water tank level gauge must be located at the pump operator's panel to provide a high visibility display of the level of water in the tank.

## **2.24 Discharges**

2.24.1 A minimum of 4 (four) 65mm discharge outlets valves must be provided at the pump panel.

2.24.2 These discharge valves must be fitted with 65mm NST Male couplings with a chained blank cap.

2.24.3 Additionally, one (1) 100mm hi-volume discharge outlet with manually operated valves must be provided at the pump panel. This discharge valve must be fitted with 100mm Storz coupling with a minimum of 100 mm lug distance with chained blank cap.

2.24.4 The valve controls must be located at the pump operator's panel and must visually indicate the position of the valve at all times.

## **2.25 Booster Tank**

2.25.1 The booster tank must have a minimum of 2000 litres capacity.

2.25.2 The entire tank must be constructed from welded polypropylene or suitable non-combustible material.

2.25.3 The tanks must be designed in accordance with NFPA or equivalent standards.

2.25.4 Baffles must be in the form of baffle balls which must protect against any water surge during travel mode within the water tank.

2.25.5 The baffle design must be such as to ensure that it occupies less than 1% of the tank content.

2.25.6 The baffle must ensure a free flow of 98% of the tank contents during pumping operations.

2.25.7 The booster tank must be fitted with a tower.

2.25.8 The tank overflow must be a minimum of 80mm diameter.

- 2.25.9 There must be two (2) standard tank openings; one for the tank to pump suction line and one for a tank fill/drain line.
- 2.25.10 The tank must be mounted on stabilising cushions to protect the tank from road shock and vibration.
- 2.25.11 The tank must be completely removable without disturbing or dismounting the vehicle body structure.

## **2.26 Hosebed**

- 2.26.1 Hosebed sides must consist of smooth aluminium or any other suitable material plate welded to a perimeter frame.
- 2.26.2 The hosebed compartment deck must be constructed entirely from maintenance free, extruded aluminium or any other suitable material.
- 2.26.3 The hosebed compartment must be free of sharp edges and projections to prevent hose damage.
- 2.26.4 A lip must be provided at the rear on the hose deck to prevent the accidental discharge of the flaked hoses during travel.
- 2.26.5 The hosebed must be designed to accommodate a supply hose and a driveline hose.

## **2.27 Handrails and Access Steps**

- 2.27.1 Access handrails must be provided at all step positions.
- 2.27.2 All body handrails must be constructed of maintenance free, corrosion resistant material.
- 2.27.3 Access steps with a non-slip surface must be provided.

## **2.28 Compartments**

- 2.28.1 A minimum of six (6) outside compartments must be provided.
- 2.28.2 All compartments must be fitted with lockable doors.
- 2.28.3 All compartments must be fitted with interior lights.
- 2.28.4 The equipment brackets must be secured to the compartments.
- 2.28.5 All body compartments must be constructed from any suitable corrosion resistant material.
- 2.28.6 A minimum of two (2) drain holes must be provided in each compartment.
- 2.28.7 A grommet must be fitted around all electrical wiring to prevent the ingress of dust and water.

## **2.29 Electrical System**

- 2.29.1 All electrical equipment installed by the vehicle manufacturer must conform to current automotive electrical system standard.



- 2.29.2 All exposed wiring must be run in a loom. All wiring looms must be properly supported and attached to body members along the entire run.
- 2.29.3 At any point where wires or looms pass through metal, rubber grommets must be installed to protect the wire from abrasion.
- 2.29.4 Electrical connections in exposed areas must be protected using heat shrink or weatherproof connections.
- 2.29.5 All circuits must be protected with automatic reset circuit breakers.
- 2.29.6 All electrical equipment switches must be positioned on a switch panel mounted in the area convenient to the operator.
- 2.29.7 Light switches must have an indicator to show when the circuit is energised.
- 2.29.8 All switches must be appropriately identified as to function.

### **2.30 Cab and Body Lighting**

- 2.30.1 Clearance lights and reflectors must fitted.
- 2.30.2 Light functions must include running lights, brake lights, turn signal lights and back-up lights.
- 2.30.3 A switch controlling the compartments lights must be fitted.
- 2.30.4 The wiring connection must be made with a weather resistant plug-in style connector.
- 2.30.5 A compartment light with a switch must be installed to illuminate the pump area for service.
- 2.30.6 A license plate light must be installed on the rear of the vehicle.

### **2.31 Step Lights**

- 2.31.1 The vehicle must have sufficient lights to properly illuminate the work areas, steps, walkways and ground areas around the vehicle.
- 2.31.2 Areas under the driver and crew area exits must be activated automatically when the exit doors are opened.
- 2.31.3 Ground area lights must be switched from the cab dash/pump panel with the work light switch.

### **2.32 Pump Panel Lights**

- 2.32.1 Working lights must be provided above the pump panel to illuminate the working area during pumping operations.

### **2.33 Back-up Alarm**

- 2.33.1 An electronic back-up alarm must be supplied.
- 2.33.2 A minimum of 97 dB (A) alarm must be wired into the chassis back-up lights to signal when the vehicle is in reverse.

### **2.34 Warning Lights**

- 2.34.1 A minimum of two (2) red warning lights must be fitted at the rear and must be controlled from inside the cab.
- 2.34.2 A minimum of two (2) red warning lights must be fitted on each side at the front of the vehicle controlled from inside the cab.

### **2.35 Light Bar**

- 2.35.1 A High Intensity LED light bar must be fitted on the cab roof. The light bar must have the following features:
  - A. Ultra low profile unit, aerodynamically efficient and unobtrusive until lit.
  - B. All-round, 360 Degree light output.
  - C. Front and rear LED clusters individually user programmable.
  - D. Low current draw. Approximately 20% of a light.
  - E. Long service life due to LED technology and no moving parts.
  - F. LEDs rated to 100,000 operational hours.
  - G. Solid state electronics.

### **2.36 Speaker/ Public Announcement (PA)**

- 2.36.1 A minimum of 100 watt speaker must be supplied and fitted.

### **2.37 Electronic Siren**

- 2.37.1 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 National 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 with a minimum of 123dB. and P.A. level with a minimum of 115dB.
  - F. Push to talk (PTT) switch on microphone allows for siren tone over-ride when selected.

### **2.38 Lower-Level Warning Light Package**

- 2.38.1 Halogen/LED warning lights with red lenses, must be provided. —.

### **2.39 Lighting must be mounted as follows:**

- 2.39.1 The vehicle must have emergency lights installed on all four sides.

**2.40 Body Paint Finish**

2.40.1 The body must be finished painted in **Red**

**2.41 Chassis and Body Stripe**

2.41.2 Yellow reflective trim in accordance with the National Road Safety Regulation shall be secured to the vehicle.

**2.42 Lettering/ Branding**

2.40.1 Lettering must be provided in accordance with the instructions from the CoJ.

2.40.2 The recommended tyre pressure labels must be placed above each wheel.

**2.43 Manuals**

2.42.1 All equipment, components and maintenance manual must be provided ( in English) with the completed unit including Service Book, with the exception of the following:

- A. Operators manuals
- B. Maintenance manuals

**2.44 Auxiliary Equipment**

2.44.1 The following equipment will be furnished with the completed unit and will be professionally mounted. The below noted equipment list, amongst others, includes the full list of equipment as prescribed by NFPA 1901: Standard for Automotive Fire Apparatus (2016 edition) or equivalent standards.

Item no.	Item description	Equipment specification
01	1 x Hydraulic cutter	<ul style="list-style-type: none"> <li>• Minimum working pressure – 720 bar</li> <li>• Minimum blade opening – 170 mm</li> <li>• Minimum cut force – 1420 KN</li> <li>• Weight – not exceeding 23 kg</li> <li>• Single quick acting coupling-core</li> </ul>
02	1 x Hydraulic spreader	<ul style="list-style-type: none"> <li>• Minimum working pressure – 720 bar</li> <li>• Minimum blade opening – 170 mm</li> <li>• Minimum spreading force – 280 KN</li> <li>• Weight – not exceeding - 23 kg</li> <li>• Minimum Pulling force – 130 KN</li> <li>• Single quick acting coupling-core</li> <li>• Minimum spreading distance – 610 mm</li> </ul>
03	1 x Hydraulic small ram	<ul style="list-style-type: none"> <li>• Minimum working pressure – 720 bar</li> <li>• Weight – not exceeding - 18 kg</li> <li>• Single quick acting coupling-core</li> <li>• First stage push force – not less than 229 KN</li> <li>• Second stage push force – not less than 83 KN</li> </ul>

04	1 x Hydraulic large ram	<ul style="list-style-type: none"> <li>• Minimum working pressure – 720 bar</li> <li>• Weight – not exceeding - 20 kg</li> <li>• Single quick acting coupling-core</li> <li>• First stage push force – not less than 229 KN</li> <li>• Second stage push force – not less than 83 KN</li> </ul>
05	2 x hydraulic hoses	<ul style="list-style-type: none"> <li>• Single quick acting couplings- core</li> <li>• Minimum length- 10m</li> <li>• Colour – two hoses with two different colours except black</li> </ul>
06	1 x hydraulic motor	<ul style="list-style-type: none"> <li>• Minimum working pressure- 720 bar</li> <li>• Maximum Weight - 35 kg</li> <li>• Minimum Motor horse power - 6.5 hp (4 stroke petrol)</li> <li>• Minimum displacement - 196cc</li> <li>• Hydraulic pump – two stage radial piston over piston</li> <li>• Tool operation – two tools simultaneous operation with turbo function</li> <li>• Single quick action coupling-core</li> </ul>
07	1 x Hydraulic hand pump	<ul style="list-style-type: none"> <li>• Minimum working pressure - 720 bar</li> <li>• Effective oil contents: 1800 cc</li> <li>• 2-stage pump unit with output 1<sup>st</sup> and 2<sup>nd</sup> stage: min. 28 cc -and 2,3 cc</li> <li>• Maximum weight - 12 kg</li> </ul>

		<ul style="list-style-type: none"> <li>• Single quick action coupling-core</li> </ul>
08	2 x Chock blocks sets	<ul style="list-style-type: none"> <li>• Must be made from plastic (HDPE-high density polyethylene)</li> <li>• Non-absorbent, oil and chemical resistant and resistant to bloodborne pathogens</li> <li>• Virtually indestructible</li> <li>• High-visibility lanyards for easy carrying and gripping</li> </ul>
09	2 x Airbag steering covers	<ul style="list-style-type: none"> <li>• easy to install, within seconds</li> <li>• suitable for all types of vehicles</li> <li>• must be provided with a synthetic storage box with wall-mounting bracket</li> </ul>
10	1 x Set edge protective cover	<ul style="list-style-type: none"> <li>• 6 Pillar covers at least 280mm x 240mm broad</li> <li>• Side window sheets at least 500mm x 700mm</li> <li>• 1 Windshield cover at least 1400mm x 800mm</li> <li>• 1 Side removal sheet 1850mm x 1200mm</li> </ul> <p><b>Additional</b></p> <ul style="list-style-type: none"> <li>• Sheets must be fitted with magnets on the edges to keep sheet in position</li> <li>• Pillar Covers must be fitted with tie down straps or Velcro strapping</li> </ul> <p><b>Manufacturing Material</b></p> <ul style="list-style-type: none"> <li>• Rip-stop</li> <li>• Woven Polyester</li> </ul>

		<ul style="list-style-type: none"> <li>• At least 280g per square meter</li> <li>• Unbrushed</li> <li>• Must be scotch guard treated.</li> </ul>
11	1 x 65mm Double jacket fire hose (65mm British Instantaneous Coupling)	<ul style="list-style-type: none"> <li>• Must have National Standard Thread</li> <li>• Maximum 10 Meter</li> <li>• Must be double jacketed</li> <li>• Must be Canvas Hose</li> <li>• Must have 100% Synthetic high tensile all polyester double jacket</li> <li>• Must have 100% Mildew resistant</li> <li>• Must be single-ply synthetic polyurethane liner resists ozone</li> <li>• Reduced weight,</li> <li>• Increased flexibility</li> <li>• Must be tested and stenciled in accordance with NFPA Standard 1961 or equivalent standards.</li> <li>• Must have minimum one year warranty for manufacturing defects and delamination</li> </ul>
12	20 x 65mm double jacket fire hoses (NST coupling)	<ul style="list-style-type: none"> <li>• Must have National Standard Thread</li> <li>• Minimum 30 Meter</li> <li>• Must be double jacketed</li> <li>• Must be Canvas Hose</li> <li>• Must have 100% Synthetic high tensile all polyester double jacket</li> <li>• Must have 100% Mildew resistant</li> <li>• Must be single-ply synthetic polyurethane liner resists ozone</li> </ul>

		<ul style="list-style-type: none"> <li>• Reduced weight,</li> <li>• Increased flexibility</li> <li>• Must be tested and stenciled in accordance with NFPA Standard 1961 or equivalent standards.</li> <li>• Must have minimum one year warranty for manufacturing defects and delamination</li> </ul>
13	20 x 38mm double jacket fire hoses (NST coupling)	<ul style="list-style-type: none"> <li>• Must have National Standard Thread</li> <li>• Minimum 30 Meter</li> <li>• Must be double jacketed</li> <li>• Must be Canvas Hose</li> <li>• Must have 100% Synthetic high tensile all polyester double jacket</li> <li>• Must have 100% Mildew resistant</li> <li>• Must be single-ply synthetic polyurethane liner resists ozone</li> <li>• Reduced weight,</li> <li>• Increased flexibility</li> <li>• Must be tested and stenciled in accordance with NFPA Standard 1961 or equivalent standards.</li> <li>• Must have minimum one-year warranty for manufacturing defects and delamination</li> </ul>
14	6 x fire branches (750l/m)	<ul style="list-style-type: none"> <li>• Must be manufactured of a metal alloy</li> <li>• Must be fitted with pistol grips</li> </ul>



		<ul style="list-style-type: none"> <li>• Must have a stainless steel shut-off sliding cylinder shut off valve</li> <li>• Must have adjustable tip - Flush, fog to straight stream</li> <li>• Must be integrated debris screen.</li> <li>• Must fit 38mm hoses with NST female couplings</li> <li>• Must have a selectable litre nozzle from approximately 100 l/min to 750l/min</li> <li>• Must be fitted with suitable steel/aluminum material spinning fog teeth</li> <li>• Must have variable setting of nozzle litre by means of shut/ open sliding valve</li> <li>• Must have minimum 5 Years Product Warranty</li> <li>• Must meet NFPA 1964 standards or equivalent standards.</li> </ul>
15	2 x fire branches (360l/m)	<ul style="list-style-type: none"> <li>• Must be manufactured of a metal alloy</li> <li>• Must be fitted with pistol grips</li> <li>• Must have a stainless steel shut-off sliding cylinder shut off valve</li> <li>• Must have adjustable tip - Flush, fog to straight stream</li> <li>• Must be integrated debris screen.</li> <li>• Must fit 38mm hoses with NST female couplings</li> <li>• Must have a selectable litre nozzle from approximately 100 l/min to 360l/min</li> <li>• Must be fitted with suitable steel/aluminum material spinning fog teeth</li> <li>• Must have variable setting of nozzle litre by means of shut/ open sliding valve</li> <li>• Must have minimum 5 Years Product Warranty</li> <li>• Must meet NFPA 1964 standards or equivalent standards.</li> </ul>
16	2 x playpipes (Solid stream branches)	<ul style="list-style-type: none"> <li>• Axial Play pipe with stacked tip smooth bore nozzle with 7cm, 3,5cm &amp; 2,5cm outlets.</li> </ul>

		<ul style="list-style-type: none"> <li>• Must be equipped with removable debris screen, durable metal ball and a smooth waterway.</li> <li>• Must have fulltime 6.35cm Swivel,</li> <li>• Must have 65mm female NST coupling.</li> <li>• Maximum weight: 3.3kg.</li> </ul>
17	5 x SCBA backpack assembly	<ul style="list-style-type: none"> <li>• The back plate shall be a one-piece, anti-static composite construction with orthopedic design so as to evenly distribute the weight of the SCBA over the user's lumbar region, hips and shoulders.</li> <li>• The waist pad shall swivel and pivot from side to side by approximately 20 degrees to increase comfort and stability when moving.</li> <li>• The shoulder and waist padding must be constructed from a high abrasion resistant, high puncture resistant, light weight, water resistant compression. The shoulder and waist padding shall be chemical resistant and fire retardant.</li> <li>• The harness webbing must be constructed of a strong, hard wearing type material.</li> <li>• The shoulder pads must be designed with an ergonomic body contoured comfort style to maintain shape when worn, providing comfort and freedom of movement, wide for optimal support. Shoulder and waist belt harnessing must be independently adjustable.</li> <li>• Shoulder and waist adjustment friction buckles must be of Flame-Retardant polyamide construction.</li> <li>• Each shoulder and waist harness padding must be easily detached from the back plate by a quick release button only. This will allow for easy cleaning and disinfection of the harness if requires without the use of tools.</li> </ul>

		<ul style="list-style-type: none"> <li>• To enable rapid donning without obstructing other wearers in, for example, confined spaces or Fire Appliance cabs, the waist adjustment should be by means of twin 'pull forward' adjusting straps</li> <li>• A cam-lock mechanism shall be used to secure the cylinder strap in place to ensure simple and secure operation.</li> <li>• The cylinder strap shall accommodate a complete range of sizes of cylinders without the use of tools.</li> <li>• The pneumatic system must be easy to detach from the back plate and harness.</li> <li>• Hoses must be routed in hose channels inside the back plate to eliminate snag potential, including over the shoulder rescue hoses.</li> <li>• Hoses must be attached to the harness via hose clips. These clips must not be detached when removing hoses for cleaning.</li> </ul> <p><b>Monitoring</b></p> <ul style="list-style-type: none"> <li>• The breathing apparatus should be provided with a pneumatic pressure gauge unit as described below:</li> </ul> <p><b>Pneumatic Pressure Gauge</b></p> <ul style="list-style-type: none"> <li>• Pneumatic pressure gauge must be fully luminescent.</li> <li>• The low-pressure whistle warning device must be integrated into the pressure gauge hose close to the gauge.</li> <li>• The pneumatic gauge must be encased by a protective rubber cover.</li> <li>• The pneumatic gauge must be located over the left shoulder.</li> </ul>
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		<p><b>The Personal Alert Safety System (PASS) device must be supplied separately or integrated on the pneumatic pressure gauge</b></p> <ul style="list-style-type: none"> <li>• Continuous location Flashes</li> <li>• Manual Alarm or Tone delay</li> <li>• Movement detector</li> <li>• Pre-set alarm after 30 seconds of no movement</li> <li>• Pre-Alarm at minimum 75 db</li> <li>• Full Alarm at minimum 90db at 2m in free air</li> <li>• Frequency range 2.5Khz – 3.5 KHz</li> <li>• LED Flashes with distress alarm</li> <li>• 1 flash every second</li> <li>• EMC tested and Approved</li> <li>• Small and low-profile maximum dimension metric 140 mm x 100mm x 50mm</li> <li>• Weight maximum 400 grams</li> <li>• Low battery indicator Audio/ Visual</li> </ul>
18	9 x SCBA cylinders	<ul style="list-style-type: none"> <li>• Cylinder must be a 300-bar pressure vessel</li> <li>• Must provide test certificate with all cylinders</li> <li>• Minimum 6l water capacity</li> <li>• The cylinder must be suitable for firefighting purpose</li> <li>• The cylinder must be manufactured from a seamless aluminum liner (Carbon Fiber), which is subsequently over wrapped with carbon and glass fibers.</li> <li>• The cylinder must have an excess flow valve to prevent uncontrolled flow on accidental opening.</li> </ul>

		<ul style="list-style-type: none"> <li>• The cylinder must have a single valve activation and ratchet to prevent inadvertent valve closure.</li> <li>• Must be light weight</li> </ul>
19	1 x medical jump bag	<ul style="list-style-type: none"> <li>• The item should be a Load n' Go.</li> <li>• It must be designed to keep equipment organized and quickly accessible using transparent pockets and elastic holsters that are arranged in a book-style configuration</li> <li>• It must be foam-lined construction maintains pack shape and protects contents</li> <li>• It must have clear, durable urethane windows, mesh pockets, and elastic holsters keep contents in place and well-organized</li> <li>• It must have ergonomic, padded shoulder straps and back panel for comfort during transport</li> <li>• It must have a quick zip access to front compartment</li> <li>• Zips must be robust.</li> <li>• Large side pockets must allow quick access to vital sign tools</li> <li>• Must be designed to carry drug module bag, Quick Roll intubation kit, LED light Attachment point.</li> <li>• Must have pathogen resistant material</li> <li>• Must have transparent sleeves and windows</li> <li>• Must be a sturdy, high-tech construction</li> <li>• Must have an IV module</li> <li>• <b>Colour:</b> tactical black/ red</li> <li>• <b>Must have a minimum Capacity</b> of 42606 cm<sup>3</sup></li> </ul>

		<ul style="list-style-type: none"> <li>• <b>Minimum Size must be:</b> Height = 50 cm. Width= 48 cm, Diameter =17 cm</li> <li>• The front side of bag must be written "City of Johannesburg" and marked with the COJEMS logo using reflective material.</li> </ul>
20	1 x Rubber Mallet	<ul style="list-style-type: none"> <li>• Must be an unbreakable nylon rubber mallet</li> <li>• Non slip grip fiberglass/plastic handle, epoxy glued and pinned.</li> </ul>
21	2 x Salvage sheet (3.7m x 4.3m)	<ul style="list-style-type: none"> <li>• Must be treated with a fire- and water-resistant finish.</li> <li>• Must meet requirements for NFPA-701 or equivalent standards (large scale), and CPAI Section 6.</li> <li>• Must have water resistant finish and mildew inhibitors.</li> <li>• Must easily be wiped clean.</li> </ul>
22	10 x Traffic cones	<ul style="list-style-type: none"> <li>• Safe, compact, highly visible</li> <li>• Must meet SABS Standards</li> <li>• Must be constructed of orange/yellow plastic material.</li> <li>• Must have reflective strip of minimum of 5cm wrapped around the cone</li> <li>• Must meet the new 2009 NFPA 1901: STANDARD FOR AUTOMOTIVE FIRE APPARATUS (2016 EDITION) apparatus standard or equivalent standards.</li> </ul>
23	1 x Automated External Defibrillator (AED)	<ul style="list-style-type: none"> <li>• Automated external defibrillator with ECG screen and manual override (unit)</li> </ul>

		<ul style="list-style-type: none"> <li>• Complete unit must include each replaceable accessory as specified within the series</li> <li>• Complete Operation/Maintenance Manual Book/File copies in English Language must be provided.</li> <li>• The unit must comply with an acceptable International Safety Standard such as IEC 60601-1 or 60601-1-2 or ISO 13485, ISO 9001 or equivalent .</li> <li>• The service provider must maintain a system for notifying and providing Users with Updates, Modifications, and Software Releases and Recalls.</li> <li>• Training in the operation of the unit must be provided.</li> <li>• All Equipment, Materials and Workmanship provided under this contract must be guaranteed for a minimum period of 2 years.</li> <li>• The service provider to note that the Guarantee period must only take effect upon successful commissioning and delivery of this unit.</li> <li>• The unit must be a button operation BIPHASIC semi-automated external defibrillator and it must be suitable for ground mobile; ambulance use and ward use in Hospitals.</li> <li>• The unit must be lightweight less than 3.4kg, it must be robustly constructed, it must incorporate the latest and reliable BIPHASIC technology and the unit <b>must conform to IEC 601-2-4 “Particular requirements for the safety of cardiac defibrillators”</b>.</li> <li>• The unit must be able to perform impedance compensation before delivering a shock to a patient.</li> <li>• Design Standards: should meets AAMI DF-80, EN 60601-1, EN 60601-1-2 and ISO 13485, ISO 9001 or equivalent.</li> <li>• P55 dust-water ingress rating</li> <li>• Passed the 1-meter drop test</li> <li>• Three-lead patient monitoring</li> </ul>
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		<ul style="list-style-type: none"> <li>• Manual override offer flexibility in monitoring, analysing, and delivering treatment.</li> <li>• Real-time feedback on both the rate and depth of chest compressions to enhance CPR resuscitation quality. Internal recording of up to four events</li> <li>• The supplier must ensure the product is in compliance with the requirements South African Health Products Regulatory Authority (SAHPRA)</li> <li>• <b>SCREEN</b></li> <li>• High-resolution LCD display.</li> <li>• Screen Size: not less than 76.7mm Width x 57.7 mm Height.</li> <li>• Sweep Speed: not more than 25 mm/sec.</li> <li>• Viewing Time: not more than 3 seconds.</li> <li>• Displayed Information on Heart rate, ECG waveform, CPR bar graph, battery gauge, elapsed time, number of shocks delivered</li> <li>• Defibrillator Energy: 50, 70, 85 joules (paediatric); 120, 150, 200 joules (adult)</li> <li>• Type: Internal non-volatile memory.</li> <li>• Memory Capacity: With audio recording enabled, minimum of 20 minutes of ECG, operator and device actions;</li> <li>• Without audio recording, minimum of 1.45 hours each for 4 patients records or a minimum of 5.8 hours for a single record of ECG and event data.</li> <li>• Expanded external data storage and transfer available with a slot for a USB memory stick</li> <li>• Event Review &amp; Reporting: Code Review software version 3.30 or higher.</li> <li>• Communications: IrDA infrared wireless for communication with personal computer or external</li> <li>• Charge Time: not more than 30 minutes with a new battery.</li> </ul>
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24	10 x Hose adaptors (two of each)	<ul style="list-style-type: none"> <li>• Must be made out of cast aluminum</li> <li>• Must be female 65mm BIC to female 65mm NST coupling</li> <li>• Must be male 65mm BIC to male 65mm NST coupling</li> <li>• must be male 65mm BIC to male 38mm NST</li> <li>• must be male 65mm NST to 65mm NST</li> <li>• Must be female 65mm NST to male 38mm NST</li> </ul>
25	1 x PPV fan	<ul style="list-style-type: none"> <li>• Must be made out of cast aluminum fan with a minimum of 7-blade air foil propeller</li> <li>• Blade must have low noise, high output design</li> <li>• Power from standard, variable speed gasoline motor</li> <li>• Direct drive system eliminates shaft for years of trouble-free operation</li> <li>• Cart style design with rear mounted wheels and pull-up full height, full width handle for easy maneuverability</li> <li>• Locking step brake to make setup lightning fast</li> <li>• The fan must be able to swivel upwards to a minimum angle of 10 degrees.</li> </ul>
26	1 x chain saw	<ul style="list-style-type: none"> <li>• Must have on/off switch</li> <li>• It must have 68-80cc two stroke engine</li> <li>• Must have a low fuel consumption</li> <li>• Must have a reduced exhaust emission levels in accordance with environmental regulations.</li> <li>• Must have an active vibration reduction</li> </ul>

		<ul style="list-style-type: none"> <li>• Must have an air purge system to assist with easy start</li> <li>• Must have a visible fuel level indicator</li> <li>• Must have 400mm to 500mm guide bars</li> <li>• Must be fitted with a chainsaw blade with the following pitch 3/8</li> <li>• Must be fitted with chain guards</li> <li>• Must have instant manual chain breaks</li> <li>• Must have an inertia automatic chain break if a kick back is experienced</li> <li>• Must have a tool less chain adjuster which is easy to reach.</li> <li>• Must be fitted with decompression valve for easy starting</li> <li>• Must be fitted with a cold start device (choke manual or automatic)</li> <li>• Must have a tool kit consisting of plug spanner, screw driver and tools required for maintenance</li> <li>• Must be provided with chain protector</li> <li>• Must be supplied with one spare chain and a sharpening kit.</li> </ul>
27	1 x Carborundum cutter	<ul style="list-style-type: none"> <li>• Must have on and off Switch</li> <li>• 2.5- 3.7 kw petrol motor (two stroke)</li> <li>• Must be fitted with a cold start device (Choke manual or automatic)</li> <li>• Must be air cooled</li> <li>• Must have active triple air filtration in cases of concrete cutting</li> <li>• Must fit 300mm to 400mm abrasive disks</li> <li>• Must have decompression switch for easy start</li> <li>• Must have a reversible cutting arm</li> <li>• Must have easy adjustable blade guard</li> <li>• Must have active vibration dampening system</li> </ul>

		<ul style="list-style-type: none"> <li>• Must have clearly visible Fuel indicator</li> <li>• The noise must be below 120db</li> <li>• Must have automatic Lubrication of Clutch bearing</li> </ul>
28	1 x Low expansion foam branch	<ul style="list-style-type: none"> <li>• Must be minimum 600 L/min at 7 bar</li> <li>• The Branch Pressure must be between 3 Bar and 8 Bar</li> <li>• Expansion ratio minimum 10:1</li> <li>• The Flow Rate must be of minimum 300L/min</li> <li>• The branch must be of minimum 14-meter throw</li> <li>• The output must be minimum 15m<sup>3</sup>/min</li> <li>• The Inlet side must be 65mm female NST inlet.</li> <li>• The couplings must be made out of Light alloy</li> <li>• Epoxy painting aluminum handle.</li> <li>• It must have a maximum weight 4 Kg</li> </ul>
29	1 x medium expansion foam branch	<ul style="list-style-type: none"> <li>• Must be a minimum of 300 L/min at 7 bar</li> <li>• Branch Pressure must be a minimum 2.5 Bar</li> <li>• Expansion ratio must be a minimum 55:1</li> <li>• Flow Rate must be a minimum 270L/min</li> <li>• Must have a minimum of 8-meter throw</li> <li>• Output must be a minimum 15m<sup>3</sup>/min</li> <li>• Must have an inlet of 65mm female NST.</li> <li>• Must be made of Stainless steel</li> <li>• Couplings must be made light alloy</li> <li>• Must be chrome plated brass nozzle.</li> </ul>

		<ul style="list-style-type: none"> <li>• Must have an Epoxy painting aluminum handle.</li> <li>• Must have a Stainless-steel gauze.</li> <li>• The branch must be Maximum weight of 7 Kg</li> </ul>
30	1 x 225 L/m inline inductor with a pick-up tube	<ul style="list-style-type: none"> <li>• Must produce a minimum of 225 L/min at 7 bar</li> <li>• Must have a setting between 1-6% induction of foam concentrate</li> <li>• It must be adjustable at a Minimum of 4.5 Bar pressure</li> <li>• It must have Maximum operating pressure 10 Bar</li> <li>• Must be a Venturi-type inductor device,</li> <li>• Inlet must be a 65mm female NST</li> <li>• Outlet must be a 65mm Male NST</li> </ul>
31	1 x 450 L/m inline inductor with a pick-up tube	<ul style="list-style-type: none"> <li>• Must produce a minimum of 450 L/min at 7 bar</li> <li>• Must have a setting between 1-6% induction of foam concentrate</li> <li>• It must be adjustable at a Minimum of 4.5 Bar pressure</li> <li>• It must have Maximum operating pressure of 10 Bar</li> <li>• Must be a Venturi-type inductor device</li> <li>• Inlet must be a 65mm female NST</li> <li>• Outlet must be a 65mm Male NST</li> </ul>
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33	1 x Pick headed axe	<ul style="list-style-type: none"> <li>• Must have a high grade tool steel</li> <li>• The Head must be heat treated</li> </ul>

		<ul style="list-style-type: none"> <li>• The Handle must be rated at a minimum 500 kg</li> <li>• Must have a strong protruded fiberglass/plastic core with an injection molded jacket for added strength</li> <li>• The axe head must be bonded to the fiberglass/plastic handle with strong two part epoxy</li> <li>• The axe head must be a drop forged with high carbon steel</li> <li>• The fiberglass / plastic handle must be a minimum of 850mm</li> <li>• The flat cutting blade must a minimum of 1.5 kg</li> <li>• It must have a minimum of 80mm pick side.</li> </ul>
34	1 x Flat headed axe	<ul style="list-style-type: none"> <li>• Must have a high grade tool steel</li> <li>• The head must be heat treated</li> <li>• The handle must be rated at a minimum of 500 kg</li> <li>• Must have a strong protruded fiberglass/plastic core with an injection molded jacket for added strength</li> <li>• The axe head must be bonded to the fiberglass/ plastic handle with strong two part epoxy</li> <li>• The axe head must be a drop forged with high carbon steel</li> <li>• The fiberglass / plastic handle must be a minimum of 850mm</li> <li>• The flat cutting blade must a minimum of 1.5 kg</li> </ul>
35	1 x Pry axe	<ul style="list-style-type: none"> <li>• It must be lightweight</li> <li>• It must be multi-purpose, slam, ram tool designed to pry and twist.</li> <li>• It must chop, cut metal, twist off locks or latches</li> </ul>

		<ul style="list-style-type: none"> <li>• The head and claw must be from a separate sections</li> <li>• Must be forged from high-alloy steel</li> <li>• Must be heat treated for maximum strength.</li> <li>• Solid steel shaft must extend the axe to a minimum of 71cm</li> <li>• Sure grip machine-grooved must have rubber Grips</li> <li>• The maximum weight must be 5kg</li> <li>• It must be a standard claw</li> <li>• Duckbill must have long, smooth incline to force windows and interiors doors.</li> <li>• Pike must be long, sharp, tapered and gently curved to fit a lock or latch.</li> <li>• Must have the following: <ul style="list-style-type: none"> <li>- Pike</li> <li>- Recessed blade</li> <li>- Axe blade</li> <li>- Teeth</li> <li>- Spanner wrench</li> <li>- Extended shaft</li> <li>- Claw shaft</li> <li>- Shaft release</li> <li>- Standard claw with gas shutoff</li> </ul> </li> </ul>
36	1 x Haligan tool	<ul style="list-style-type: none"> <li>• It must be made out of Heavy duty Steel or steel alloy</li> <li>• The machine grooved must have non- slip grip</li> <li>• The Inclined duckbill must be Long and smooth</li> <li>• The Pike must be long, tapered and gently curved to fit a lock or a latch</li> <li>• Must be Fitted with standard claw and metal cutting claw</li> </ul>

37	1 x Scoop stretcher	<ul style="list-style-type: none"> <li>• It must be suitable for moving, immobilizing, lifting and carrying patient in the pre-hospital care environment.</li> <li>• The stretcher must allow the EMS practitioner to place a stretcher beneath the patient without moving the patient, therefore reducing the risk of further injury.</li> <li>• Length Opened must be maximum of 166cm</li> <li>• Length Folded must be maximum of 120cm</li> <li>• Width Open must be maximum of 43cm</li> <li>• Weight must be maximum of 7kg</li> <li>• Minimum Load Capacity of 160kg whilst the board is supported only at the head and feet.</li> <li>• Must fold for compact storage</li> <li>• The unit must have telescoping tubes to allow length adjustments to fit patients of various heights.</li> <li>• The unit must have a narrow foot frame for handling in confined areas. Foot frame handles to be tapered upwards to allow ease of lifting.</li> <li>• It must be able to uncouple at two ends</li> <li>• It must have a narrow foot end</li> <li>• Open center design to allow for x-rays to be taken</li> <li>• Must be made from high quality aluminium</li> <li>• The scoop stretcher must be designed with a minimum of 8holes to fit a standard spider harness.</li> </ul>
38	2 x Portable oxygen cylinder	<ul style="list-style-type: none"> <li>• Must have Pin index connection</li> </ul>

		<ul style="list-style-type: none"> <li>• Must be made of Aluminium body</li> <li>• Must Holds a D-sized tank.</li> <li>• Dimensions must be at minimum of: Diameter 11cm, Length 40cm.</li> <li>• Must have a black body with white neck</li> <li>• Must include the rust plastic casing.</li> </ul>
39	2 x Pin index oxygen regulator	<ul style="list-style-type: none"> <li>• Must have a Dial Click Stop Constant Flow with Pressure Gauge to Register Cylinder Pressure.</li> <li>• Oxygen must be delivered through Click Stop; Hand Dial marked 0-25 l/min.</li> <li>• Construction must be : Outer body -Aluminium, Inner Liner - Brass</li> <li>• Regulator must be supplied 5 x BODOC seals.</li> <li>• Pressure Dial must be protected by a rubber type ring. The device must be able to operate input pressure of at least 200 bars.</li> <li>• Must carry a minimum of 2 years Warranty</li> <li>• Must have a Therapy flow rate selector</li> <li>• The flow rate must be indicated in the display window to choose from ½, to 15 litres per minute</li> </ul>
40	1 of each Kendrick Extrication Device (adult /child)	<ul style="list-style-type: none"> <li>• The item should be Ideal for immobilizing and extricating the patient from Motor Vehicle Incidents and/or confined spaces.</li> <li>• Rigid Spinal (back) support extrication device with built-in neck support and chest flaps.</li> <li>• Unit must be capable of immobilization of spinal cord when correctly applied.</li> </ul>



		<ul style="list-style-type: none"> <li>• Weight should not exceed 3 kg. Must include 2 forehead/chin restraints that attach to a movable head immobilization system, and carry case.</li> <li>• Chest and extremity straps must be color-coded with sewn-in securing straps and snap-lock quick release buckles.</li> <li>• Carrying handles must be securely attached to the device in such a way as to withstand a patient's weight up to minimum of 40kg with no loss of integral strength.</li> <li>• Covering material must be heavy-duty, vinyl-coated nylon or similar, durable and washable.</li> <li>• Should secure a patient in the seated and/or standing position.</li> <li>• Must be able to be used for multiple patient sizes.</li> <li>• The adjustable, fold-back sides permit easy access to patient chest.</li> <li>• The wraparound design should provide horizontal flexibility for easy application and vertical rigidity for maximum support of the spine, neck and head during extrication.</li> <li>• Maximum load capacity must not be less than 60 kg</li> <li>• Restraint straps must be a minimum of 25mm nylon webbing with snap-lock quick release buckles.</li> <li>• The device must carry a minimum of a two year guarantee.</li> <li>• X-ray, MRI (Magnetic resonance imaging) and CT (computed tomography) Scans as well as advanced life support procedures should be able to be performed with the device in place.</li> </ul> <ul style="list-style-type: none"> <li>• <b>Pediatric/Child</b> <ul style="list-style-type: none"> <li>- Length: between 790 mm -1170 mm</li> <li>- Width: not less than 200 mm</li> <li>- Height: between 50 mm-200 mm</li> <li>- Weight: not more than 3 kg</li> </ul> </li> </ul>
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		<ul style="list-style-type: none"> <li>• <b>Adult</b></li> <li>- Length: between 890 mm-1370 mm</li> <li>- Width: not less than 230 mm</li> <li>- Height: between 80 mm-230 mm</li> <li>- Weight: not more than 3kg</li> </ul>
41	1 of each Traction splint (adult/child)	<ul style="list-style-type: none"> <li>• The unit must be a light weight femoral traction splint for use in the pre-hospital environment.</li> <li>• The unit must be capable of immobilization and traction of fractured femurs.</li> <li>• The unit must be easily applied. (one person application) nothing to assemble – always ready to use.</li> <li>• Incorporate an articulating ischial perineal cushion that is comfortable and conforms to the pelvis, simplifying pelvic procedures.</li> <li>• It must permit traction to decrease as the spasm releases.</li> <li>• The child unit must be adjustable for a range to fit an infant to a child of 6 years.</li> <li>• The unit must be able to be applied with minimum movement of the legs.</li> </ul> <p><b>Construction</b></p> <ul style="list-style-type: none"> <li>• It must be lightweight aluminium and stainless steel constructed.</li> <li>• It must be compact to allow for easy storage.</li> <li>• It must have a telescoping frame for adjusting length.</li> <li>• All points of possible contact with patient must be protected to prevent pressure injury.</li> <li>• It must be completed with a carry case</li> </ul>

		<ul style="list-style-type: none"> <li>• It must provide inline mechanical traction by means of a quick release ratchet strap</li> <li>• It must have an adjustable length</li> <li>• It must have a simple adjustable wrap around ankle hitch designed to allow for the monitoring of pedal pulses</li> <li>• It must have soft padded leg straps</li> <li>• It must have low-profile ischial pad allowing the splint to be applied with minimum movements of the injured leg</li> <li>• It must have a Folding Heel stand: Folding flat for storage and instantly locks in place for support</li> </ul>
42	4 x Standpipes (key and bar)	<ul style="list-style-type: none"> <li>• Must be made out of steel alloy</li> <li>• Must be between 1m and 1.5m long</li> <li>• The swivel head must be 65mm diameter Female instantaneous</li> <li>• Must fit the London V thread (LVT) 65 mm</li> <li>• London Round Thread to London V thread adaptor to standpipe.</li> <li>• Must be supplied with key and bar</li> </ul>
43	2 x Hydrant wheels	<ul style="list-style-type: none"> <li>• It must be constructed from Aluminum Alloy</li> <li>• Minimum Dimension: Diameter 150mm, Thickness 20mm</li> <li>• Finishing must be red powder coated</li> <li>• Must indicate close and open directions</li> </ul>
44	2 x Hydrant keys (X shape)	<ul style="list-style-type: none"> <li>• Must be made out of Stainless steel.</li> <li>• Must be wheel spanner shape</li> </ul>

45	2 x High volume hose spanner	<ul style="list-style-type: none"> <li>• Must fit 100mm Storz Couplings and 65mm NST Couplings</li> </ul>
46	1 x 65mm collecting breeching	<ul style="list-style-type: none"> <li>• Must be made out of Lightweight aluminum alloy</li> <li>• Must have 2 x 65mm NST female inlets</li> <li>• Must have a self-locking valves for positive handle positioning.</li> <li>• 1 x 65mm NST Male outlet</li> </ul>
47	1 x 65mm dividing breeching	<ul style="list-style-type: none"> <li>• Must have 65mm NST female inlet</li> <li>• 2 x 65mm NST male outlets</li> <li>• Must be made of hard anodized metal</li> <li>• It must have an Aluminum Shut off valves with high tensile control handles</li> <li>• It must have Self-locking valves for positive handle positioning</li> <li>• It must have a minimum weight of 7 Kg</li> <li>• Must be flow efficient at a minimum of 2400L/min through each valve.</li> </ul>
48	1 x Set of general spanners (10, 11,12,13,14,15,17,19, battery pliers, normal pliers, long nose pliers, and shifting spanner)	<ul style="list-style-type: none"> <li>• All spanners must be made of stainless steel:</li> <li>- Spanner sizes 10, 11, 12, 13, 14, 15, 17,19</li> <li>- Battery plyers</li> <li>- Normal plyers</li> <li>- Long nose plyers</li> <li>- 250mm shifting spanner</li> </ul>

49	1 x Woodlands hydrant adaptor	<ul style="list-style-type: none"> <li>• Must be made out of steel alloy</li> <li>• Inner diameter must be 100mm</li> <li>• Must be fitted with 100mm Stortz coupling and blank cap.</li> </ul>
50	2 x 65mm hose ramps	<ul style="list-style-type: none"> <li>• Bridges must give you economical hose line protection for up to 65mm hose lines.</li> <li>• It must be not less than 30cm wide and must be interlocked to any width</li> <li>• Must be equipped with reflective safety strips for added visibility.</li> <li>• Must be made of fibre reinforced rubber.</li> <li>• Must accommodate two hoses.</li> </ul>
51	2 x Dry chemical powder extinguisher	<ul style="list-style-type: none"> <li>• Must be suitable for Class A, B and C fires.</li> <li>• The cylinder must be made out of steel</li> <li>• Must be 9kg</li> </ul>
52	2 x CO2 extinguisher	<ul style="list-style-type: none"> <li>• Must be suitable for Class A, B and C fires.</li> <li>• The cylinder must be made out of steel</li> <li>• Must be 9kg.</li> </ul>
53		•
54	1 x Large bolt cutter	<ul style="list-style-type: none"> <li>• Must have a minimum of 750mm long</li> <li>• Must have heavy duty jaw bolts</li> <li>• Must have heavy duty straps</li> <li>• Must have rounded edge cutters to Brinell 400 and Rockwell C42 hardness</li> <li>• It must have nose Straps</li> </ul>

55	1 x Small bolt cutter	<ul style="list-style-type: none"> <li>• Must have a minimum of 450mm long</li> <li>• Must have heavy duty jaw bolts</li> <li>• Must have heavy duty straps</li> <li>• Must have rounded edge cutters to Brinell 400 and Rockwell C42 hardness</li> <li>• It must have nose Straps</li> </ul>
56	1 x Bow saw	<ul style="list-style-type: none"> <li>• It must have a minimum of 500mm cutting length</li> <li>• It must have a blade tensioner</li> </ul>
57	1 x Hack saw	<ul style="list-style-type: none"> <li>• It must have a minimum of 300mm cutting length</li> <li>• It must have a steel/ plastic wrap around handle</li> </ul>
58	2 x Safety belt cutters	<ul style="list-style-type: none"> <li>• It must cuts through seat belts.</li> <li>• Its must be made of high strength Aluminum alloy.</li> <li>• The Tip must be fitted with Dzus Key for opening aircraft panels.</li> <li>• Must cut 4500kg strength webbing with one stroke.</li> </ul>
59	1 x Pitch fork	<ul style="list-style-type: none"> <li>• Must be made out of Malleable iron head</li> <li>• The handle must be Fiberglass</li> <li>• It's butt must be made out of rubber</li> </ul>

60	1 x Combination fuel/oil can	<ul style="list-style-type: none"> <li>• Must be SABS Approved for combustible liquids</li> <li>• Must be made from a durable material</li> <li>• Fuel capacity must be of no less than 4 liters and not more than 6 liters</li> <li>• Must hold up to 2 liters of oil</li> <li>• Pouring spouts must be incorporated into closing lids</li> </ul>
61	5 x 100mm double jacket high volume supply hoses	<ul style="list-style-type: none"> <li>• Must be a Storz Couplings</li> <li>• Must be 15 Meter long</li> <li>• Must be Double Jacketed</li> <li>• Must be Canvas Hose</li> <li>• Must be 100% Synthetic high tensile all polyester double jacket</li> <li>• Must be single-ply synthetic polyurethane liner which resists ozone</li> <li>• Must be mildew resistant</li> <li>• It must be lightweight</li> <li>• It must have an increased flexibility</li> <li>• It must be tested and stenciled in accordance with NFPA Standard 1961 or equivalent standards.</li> </ul>
62	2 x Pike poles	<ul style="list-style-type: none"> <li>• Must be made out of malleable iron head and fiberglass round handle</li> <li>• Must have hook and tooth</li> <li>• Must have a Rubber Butt</li> </ul>
63	1 x Ground monitor	<ul style="list-style-type: none"> <li>• Must be Portable and Manually operated.</li> <li>• Must have 2x 65mm NST Female inlet fittings.</li> </ul>

		<ul style="list-style-type: none"> <li>• Must have high flow rate.</li> <li>• Must be Fitted with nozzle</li> <li>• The nozzle must be adjustable from fog to jet</li> <li>• Must have adjustable height</li> <li>• It must rotate at a minimum of 180 degree</li> <li>• Must have automated oscillating sprinkle system.</li> </ul>
64	1 x Battery suction unit	<ul style="list-style-type: none"> <li>• Must have a minimum battery operational time of 60 minutes (High Capacity rechargeable).</li> <li>• Must have a Capacity of the aspiration container at a minimum of 800ml</li> <li>• Must have a Protection for electrical shock</li> <li>• Must have integrated filter: Internal bacterial filter/fluid shut off.</li> <li>• Must have the following Electrical requirement: 100-240Volt AC, 47- 63Hertz, 0.5A max.12Volt DC, 33Watt max.</li> </ul>
65	2 x Stabilizing head blocks sets	<ul style="list-style-type: none"> <li>• Must have a large ear hole in each head support.</li> <li>• It must have an attachment base system that allows for the head blocks to be attached to a trauma board or scoop stretcher.</li> <li>• It must have reusable head and chin straps which are fully adjustable for length (Velcro or clip attachment to the head blocks).</li> <li>• Device must be X-ray lucent and must have minimal interference with Magnetic Resonance Imaging (MRI), or computerized tomography (CT) scanning procedures.</li> <li>• It must be a non-disposable item.</li> </ul>



		<ul style="list-style-type: none"> <li>• Must be applied with minimum movement of the cervical spine.</li> <li>• Complete system must consist of contoured head blocks, a base pad with adhesion to secure the blocks and the head and chin straps.</li> <li>• Blocks must be constructed of plastic coated closed cell foam which must prevent bacterial growth within components.</li> <li>• Must not absorb blood or body fluids.</li> <li>• Must be easy to clean and not affected by adverse weather conditions (moisture).</li> <li>• The maximum weight must be 1kg.</li> <li>• Dual-purpose head supports must be tapered on the one side so that they can be used with a flat backboard or scoop stretcher.</li> <li>• The device must carry a one year guarantee.</li> <li>• Must have a Minimum length of 400 mm</li> <li>• Must have a minimum Width of 260 mm</li> <li>• Must have a minimum Height of 170 mm</li> <li>• Must have a maximum weight of 794g</li> </ul>
66	1 x Bag valve mask (manual resuscitator) adult, child, and infant	<p><b>Adult manual resuscitator</b></p> <ul style="list-style-type: none"> <li>• The bag must be operable with one hand.</li> <li>• The Bag must be capable of rapid and full re-expansion.</li> <li>• It must have a swivel connector present to allow for changing angle of operation.</li> <li>• It must have 22mm outer diameter and 15mm internal diameter fittings.</li> <li>• The unit must not be affected by extremes of high/ low temperatures.</li> <li>• It must have an oxygen inlet which is compatible with the oxygen tubing.</li> <li>• It must have a bag volume of minimum 1500 ml.</li> </ul>

		<ul style="list-style-type: none"> <li>• It must have Stroke volume of maximum 1000 ml.</li> <li>• Cuffed Face mask must be clear and provide a leak proof seal.</li> <li>• Must have Standard 22mm Internal Diameter. Mask sizes 4 and 5 to be supplied.</li> <li>• Must have a compatible valve fitting to standard external (positive end-expiratory pressure) PEEP fitting W/POP-OFF 60 cmH2O</li> <li>• It must be made of silicone, non-disposable.</li> <li>• It must be suitable for sterilization by autoclave or cold chemical.</li> <li>• Oxygen enrichment reservoir bag must be at a minimum of 2600 ml</li> <li>• Must be supplied in a soft carrying case made of a durable, washable material with appropriate carrying straps.</li> <li>• Adult bag volume must have a minimum of 1700ml</li> </ul> <p><b>Child manual resuscitator</b></p> <ul style="list-style-type: none"> <li>• The bag must be operable with one hand.</li> <li>• The Bag must be capable of rapid and full re-expansion.</li> <li>• It must have a swivel connector present to allow for changing angle of operation.</li> <li>• It must have 22mm outer diameter and 15mm internal diameter fittings.</li> <li>• The unit must not be affected by extremes of high/ low temperatures.</li> <li>• Must allow for oxygen inlet via oxygen tubing.</li> <li>• It must have a bag volume of minimum 500 ml.</li> <li>• It must have Stroke volume of maximum 350 ml.</li> <li>• Cuffed Face mask must be clear and provide a leak proof seal.</li> <li>• Must have Standard 22mm Internal Diameter. Mask sizes 1,2 and 3 to be supplied.</li> </ul>
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		<ul style="list-style-type: none"> <li>• Must have a compatible valve fitting to standard external (positive end-expiratory pressure) PEEP fitting W/POP-OFF 60 cmH2O</li> <li>• It must be made of silicone, non-disposable.</li> <li>• It must be suitable for sterilization by autoclave or cold chemical.</li> <li>• Oxygen enrichment reservoir bag must be at a minimum of 900ml</li> <li>• Must be supplied in a soft carrying case made of a durable, washable material with appropriate carrying straps.</li> <li>• Child bag volume must have a minimum of 470ml</li> </ul> <p><b>Infant manual resuscitator</b></p> <ul style="list-style-type: none"> <li>• The bag must be operable with one hand.</li> <li>• The Bag must be capable of rapid and full re-expansion.</li> <li>• It must have a swivel connector present to allow for changing angle of operation.</li> <li>• It must have 22mm outer diameter and 15mm internal diameter fittings.</li> <li>• The unit must not be affected by extremes of high/ low temperatures.</li> <li>• Must allow for oxygen inlet via oxygen tubing.</li> <li>• It must have a bag volume of minimum 280 ml.</li> <li>• It must have Stroke volume of maximum 150ml.</li> <li>• Cuffed Face mask must be clear and provide a leak proof seal.</li> <li>• Must have Standard 22mm Internal Diameter. Mask sizes 00, 0 and 1 to be supplied.</li> <li>• Must have a compatible valve fitting to standard external (positive end-expiratory pressure) PEEP fitting W/POP-OFF 40 cmH2O</li> <li>• It must be made of silicone, non-disposable.</li> </ul>
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		<ul style="list-style-type: none"><li>• It must be suitable for sterilization by autoclave or cold chemical.</li><li>• Oxygen enrichment reservoir bag must be at a minimum of 600ml</li><li>• Must be supplied in a soft carrying case made of a durable, washable material with appropriate carrying straps.</li><li>• Child bag volume must have a minimum of 150ml</li></ul> <p><b>Physical Characteristics of Adult, Pediatric and Child BVM</b></p> <ul style="list-style-type: none"><li>• Transparent Facemask allows for easy monitoring of skin color, signs of vomitus or body fluids.</li><li>• Complete with Oxygen Reservoir System.</li><li>• Controlled Flow rate.</li><li>• Controlled Airway Pressure</li><li>• Controlled Ventilation.</li><li>• Reduced Risk of Gastric Insufflations.</li></ul> <table><tr><td>Inspiratory Resistance minimum</td><td>3.30 mm H<sub>2</sub>O</td></tr><tr><td>Expiratory Resistance minimum</td><td>2.20 mm H<sub>2</sub>O</td></tr><tr><td>Reservoir Volume minimum</td><td>2700 ml</td></tr></table>	Inspiratory Resistance minimum	3.30 mm H <sub>2</sub> O	Expiratory Resistance minimum	2.20 mm H <sub>2</sub> O	Reservoir Volume minimum	2700 ml
Inspiratory Resistance minimum	3.30 mm H <sub>2</sub> O							
Expiratory Resistance minimum	2.20 mm H <sub>2</sub> O							
Reservoir Volume minimum	2700 ml							
67	2 x spider harness	<ul style="list-style-type: none"><li>• The Spider Straps must provide effective immobilization of patients on a spinal board.</li><li>• The Spider Straps must attach to 10 positions on the spinal board using hook and loop straps.</li><li>• The unit must secure the patient from shoulder to foot.</li></ul>						

		<ul style="list-style-type: none"> <li>• The spider straps must be designed for use in different types of Spinal Boards, and must be compatible with similar models.</li> <li>• Minimum Dimension of 145cm x 66 cm</li> <li>• Maximum Weight of 300 g</li> <li>• Locking design: Velcro</li> </ul>
68	4 x Shoulder pack straps	<ul style="list-style-type: none"> <li>• Must be designed for heavy-duty hose carry.</li> <li>• Straps must be interconnected by three stiff nylon spines giving the Hose Vice a strong, secure feel.</li> <li>• The shoulder straps must be adjustable, removable and be large enough that a firefighter can carry the bundle across the body for better balance.</li> <li>• The unit must have additional handles incorporated into the ends of the four shoulder straps.</li> <li>• Must have provisions to be carried by two firefighters.</li> <li>• Must have a large carrying capacity.</li> <li>• It must carry up to minimum of 30m of 38m hose.</li> <li>• It must have Adjustable side release buckles that can be used with the gloved hand and easy-to-operate.</li> </ul>
69	1 x Roof ladder	<ul style="list-style-type: none"> <li>• The ladder must fully comply with NFPA 1931 standard of Approval or equivalent standards.</li> <li>• The ladder must be made of Aluminium Alloy which is capable of withstanding intensive heat</li> <li>• The ladder must be at least 4200mm long and 450 mm wide</li> </ul>

		<ul style="list-style-type: none"> <li>• The ladder must have a maximum weight of 21kg</li> <li>• The ladder must be equipped with folding hooks constructed from a heat treated steel</li> <li>• The rungs shall be ribbed</li> </ul>
70	2 x Suction spanner	<ul style="list-style-type: none"> <li>• Must be made out of Stainless steel.</li> </ul>
71	1 x Pick and handle	<ul style="list-style-type: none"> <li>• The handle must be made of Polypropylene or Fiberglass</li> <li>• It must be a two piece set</li> </ul>
72	1 x Three section ladder	<ul style="list-style-type: none"> <li>• Minimum length 6m</li> <li>• It must be an aluminum two-section extension ladder.</li> <li>• The fly section must be operated by a cable and must automatically extend as the Centre section is raised.</li> <li>• The rungs must be ribbed</li> <li>• The ladder must meet the requirements of the current edition of NFPA 1931 or equivalent standards.</li> </ul>