TNPA FIRE AND EMERGENCY SERVICES

Major Pumper Fire Engine Specification

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MAJOR PUMPER FIRE ENGINE SPECIFICATION

INTRODUCTION:

The vehicle required would be a purpose-built standard water and equipment carrying fire appliance used primarily for fire-fighting purposes. Purpose designed vehicles manufacturer/assembled in the Republic of South Africa are preferred. The vehicle shall comply with all relevant SABS Codes of Practice, the National Fire Protection Association Standard for Automotive Fire Apparatus (NFPA 1901 as amended and in its most recent edition) as well as the National Road Traffic Act and all other applicable legislation, norms and standards in respect of standard of material, design and manufacturing standards and it is mandatory that contractors give a clear undertaking whether they would abide by these requirements.

SCOPE:

This specification provides for the supply and delivery of a Major Pumper Fire Engine which should incorporate the technical advances in chassis design that are suggested characteristics for a mobile water and foam tender vehicle. These vehicles shall be supplied with equipment in enclosed compartments as well as fixed mounted equipment including fire pump. On delivery the vehicles shall be registered as emergency units and the completed vehicles shall be delivered to these respective Ports: Ports of Cape Town, Durban, Port Elizabeth and East London.

MANUALS AND ACCESSORIES:

The service provider shall offer a complete vehicle including all the manuals and accessories and shall be responsible to have such items supplied.

DOCUMENTATION:

Chassis manuals: According to chassis manufacturer's delivery extent:

2 x Operations Manual, Hard Copies
2 x Lubrication schedules, Hard Copies (integrated in Operation Manual)
2 x Maintenance book, Hard Copies
2 x Service book, Hard Copies
2 x Data cards, Hard Copies

Superstructure manuals:

2 x Operation manuals in English, Hard Copies.
2 x Service and Maintenance manuals in English (integrated in the operation manual), Hard Copy
2 x Check-lists in English (Poster type), for daily and periodical service and maintenance
2 x Illustrated spare part catalogue in English,

All manuals are supplied in a moisture proof plastic pouch, where feasible.

ACCESSORIES:

The following accessories shall be supplied.
1 x Vehicle hydraulic jack with handle
1 x Wheel wrench
1 x Heavy Duty Wheel Chocks
1 x Pair of reflective triangles
1 x Tool roll
1 x Spare Wheel

KEYS

Upon delivery for the following sets of keys shall be supplied:
2 x Ignition and Cabin doors
2 x Locker doors

WARRANTY:

The service provider shall submit full details of their warranty commitments on the vehicles as well as all new equipment. The service provider shall also undertake to ensure that satisfactory after sales service and maintenance support is provided.

Tenderers are required to state guarantee offered on the following:

- Chassis cab – minimum 5-year warranty
- Equipment - minimum 5-year warranty
- Pump - minimum 5-year warranty
- Paint - minimum 5-year warranty
- Water tanks – shall have a lifetime warranty

ROAD TRAFFIC ACT 1996 (ACT 93 OF 1996):

The vehicles and equipment shall comply with the above acts in every respect, where applicable.

All vehicles, except sedans and motorcycles, must display the following in a conspicuous place on the left-hand side of the vehicle, in letters and figures at least 40mm high:

a) The tare of such vehicle in kg (denoted as T)
b) The permissible maximum vehicle mass in kg (denoted as V)
c) The permissible maximum drawing vehicle mass in kg (denoted as D/T)

Vehicles of which the gross vehicle mass exceeds 3500 kg, must be provided with a stamped plate or pressed plate with particulars as indicated on attached Form A.5 thereon, placed at a conspicuous place in terms of Regulation 369 of the Road Traffic Act 1996.

REGISTRATION OF VEHICLES:

The successful service provider shall register the vehicles in an appropriate category including the maximum number of occupants, license them, provide and fit the respective number plates. On delivery the vehicles shall be registered as emergency units. The above shall be included in the tender price.

SERVICE REQUIREMENTS AND FREE SERVICE:

The service provider shall provide detailed information on warranties pertaining to the whole fire engine including all fixtures and accessories and must include a detailed service plan.

Preference will be given to suppliers who will be able to perform routine repair work on site (at the port Fire Station).

The service provider shall guarantee to keep sufficient stocks of spares for critical components of the vehicle and fire engine pumping system in the RSA for scheduled maintenance of the equipment, according to the manufacturer's maintenance schedule.

The service provider shall state the amount and type of spare parts that will be kept in stock for emergency repair purposes.

The service provider shall state what the maximum delivery time will be if spare parts have to be imported.

The service provider shall state in their tender what free services are included in their offers and where these services will be carried out.

The service provider shall be required to supply proof of their technical ability to repair and service the vehicles/equipment offered.

DRAWINGS:

The following drawings shall be submitted with the tender:

General arrangement drawings of the vehicle showing the tenderers proposal and indicating all essential features and dimensions shall be submitted.

Tenderers must also submit photographs, pamphlets and/or illustrations, together with their tender documents of a similar vehicle with mounted equipment as specified.

TOOLS:

Tenderers shall submit a list of special tools if applicable (per covering letter) indicating the more essential tools to be kept on hand and shall quote for these separately.

INSPECTION OF VEHICLES AT BODY BUILDERS:

Provision shall be made for at least 5 (Five) TNPA officials for inspection of the units after the tender has officially been awarded. These inspections shall be carried out as follows:

If unit is imported:

- When the vehicles have been completed at the premises of the vehicle builder.
- Upon delivery of the equipment to be mounted.
- Final inspection prior to delivery.

If the unit is locally manufactured:

- When the chassis arrives at the premises of the vehicle builder.
- Upon delivery of the equipment to be mounted.

- Final inspection prior to delivery.

All of the above shall be for the successful tenderers account.

TECHNICAL REQUIREMENTS:

Please note that all vehicles shall be supplied in accordance with the ROAD TRAFFIC ACT 1996 (ACT 29 OF 1996) and SABS COMPULSORY SPECIFICATIONS applicable to the category vehicles concerned.

RESPONSIBILITY OF TENDERER:

Each tenderer shall provide a detailed description of the apparatus, a list of equipment to be furnished, and other construction and performance details to which the apparatus shall conform. This shall include, but shall not be limited to, estimated mass (weight), wheelbase, turning clearance radius, principal dimensions, transmission, axle ratios, and, if applicable, the rated capacity of the aerial device. The purpose of these specifications shall be to define what the tenderer intends to furnish and deliver to TNPA.

A qualified and responsible representative of the successful tenderer shall advise personnel specified by TNPA in the operation, care, and maintenance of the fire apparatus and equipment delivered.

SPARES:

The service provider shall maintain a spares department to furnish replacement parts and service. Ample stock of individual components and unit replacements shall be carried for as long a period as demand warrants.

TRAINING:

Comprehensive driver operator training is to be provided by the successful service provider at the premises specified by TNPA. The cost of the training shall be included in the tender price. A minimum of three drivers should be catered for.

TECHNICAL SPECIFICATIONS:

1. CHASSIS

1.1 CARRYING CAPACITY:

The load ratings of the chassis shall be adequate to carry the mass of the apparatus, fully loaded with water, personnel and miscellaneous equipment as stated.

The unequipped personnel mass shall be calculated at 90 kg per person multiplied by the number of seating positions on the apparatus.

A final manufacturer's certification of the load ratings, along with a certification of the gross axle mass ratings, shall be supplied on a stamped or pressed plate affixed to the vehicle.

1.2 CHASSIS:

A chassis suitable for the fire service shall be supplied. The complete chassis/cab of the apparatus on offer shall be fully homologated for South Africa and the vehicles shall be supplied with a SABS Letter of Authority.

Each chassis shall be sturdy and able to carry the specified loads when moving over rough terrain, with negligible deflection.

The chassis shall be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required.

All lubrication points shall be provided with good quality grease nipples.

Two front and two rear tow hooks/tow eyes shall be attached to the frame structure to allow towing of the apparatus without damage.

The vehicle shall have a ground clearance of no less than 350 mm when fully laden.

The width of the vehicle shall not exceed 2,500 mm.

The height of the vehicle shall not exceed 3,800 mm.

The vehicle offered shall be at a minimum of a 4 x 2 vehicle.

A departure and approach angle of minimum 25º is required.

1.3 BUMPER EXTENSION WITH WINCH

The cab shall be fitted with an extended front bumper of a minimum of 350mm covered with aluminum tread plate. A 12 Volt electric winch, driven from the vehicle power, with a pulling capability of at least 5000 kg on a single line shall be recessed in the bumper extension. The winch shall be mounted in such a way that no damage is caused to any component of the vehicle when in use. The winch must be controllable form outside the vehicle.

The winch shall carry at least 30m of 10mm cable. The winch motor must be reversible and controllable by a disc brake. The remote control for the winch shall be securely stowed in the cab.

1.4 STEERING

The steering shall be for right hand drive.

Steering shall be hydraulic power assisted and be speed sensitive. The system shall be able to operate mechanically should the hydraulic system fail.

1.5 SUSPENSION

The vehicle offered shall have a Manufacturer's Gross Vehicle Mass (GVM) rating of no less than 13 000 kg.

1.6 BRAKES:

Foot Brake: ABS (anti-block system) drum type dual-circuit pneumatic brakes, acting on front and rear wheels. Special design for Fire Brigades, 10 bar pressure.

Engine Brake: Low noise exhaust brake with permanently open throttle valve.

Parking Brake: Spring loaded and air controlled without linkages, acting on rear wheels.

1.7 ENGINE:

The vehicle offered shall have a power output of no less than 205 kW (280 hp) at 2,300 r/min.

The engine compartment must be easily accessible.

All vehicles with a rated GVM of higher than 10 000kg shall be fitted with an engine governor or electronic fuel control system, which will limit the speed of the engine under all conditions of operations to a maximum governed speed of 110 km/h.

The installation of the engine, transmission, and engine- and transmission-driven accessories (PTOs, etc.) shall meet the engine and transmission manufacturer's installation recommendations for the service intended. The PTO shall be capable of driving the fire pump in combined high and normal pressure mode in line with the vehicle's transmission safety margins as specified by the chassis supplier. Documentary proof of this shall be supplied with the tender.

The engine's cooling system shall be heavy duty and maintain a temperature in the engine at or below the engine manufacturer's maximum temperature rating under all conditions for which the apparatus is designed. The cooling system shall be protected against corrosion by an approved additive to the cooling water.

As a minimum, a six cylinder 4-Stroke intercooler turbocharged diesel engine with direct injection and pressure lubricated is required.

Oil in accordance with API service CH-4/SJ will be used in the engines.

All oil and fuel filters shall be of the replaceable element type.

The engine shall be fitted with a manufacturer's approved large capacity replaceable element air filter. There shall be very little appreciable reduction in engine power due to throttling in air intake. The air intake point shall be situated as such as to ensure the least possible intake of dust and moisture.

1.8 TRANSMISSION

The vehicle shall have at least 5 speed automatic transmission gearbox.

1.9 CAB ASSEMBLY:

A four-door all steel factory manufactured cab is required.

Access to the vehicle, for the driver, and the crew shall be unobstructed and as large as possible with wide opening forward hung doors. Access shall be possible with a minimum of two steps.

Each crew riding position shall be provided with a seat and an approved seat belt designed to accommodate a person with and without heavy clothing. Each crew riding position shall be

within a fully enclosed personnel area. The crew riding position shall be fitted with a bench seat with four SCBA backrests whereby the crew members are riding in driving direction. The crew riding position shall be compliant to NFPA 1901 standards and must be able to accommodate a minimum of four (4) SCBA sets.

The cab's side windows shall be manually operated from inside the cab. All glass shall be safety glass.

The crew cab entries shall be fitted with handrails for ingress and egress.

The cab shall be equipped with sufficient lighting. The lights will be switched on automatically when one of the cab doors are opened as well as be equipped with an override switch when lighting is required by the crew.

The passenger side mirror shall be mounted in a manner that ensures that the driver has a clear view when the passengers are in their normal seated positions.

A red/amber flashing light/indicator of at least 50 mm shall be mounted in the cab and shall indicate if a cab or compartment door is open.

The following instrumentation and controls shall be mounted in the vehicle compartment and shall be identified and visible to the driver while seated. Controls and switches that are expected to be operated by the driver while the apparatus is in motion, shall be within reach of the driver:

Oil pressure indicator or gauge,
Engine temperature indicator or gauge,
Fuel level indicator,
Air pressure gauge, if applicable
Electric horn,
Ammeter or light,
Hazard indicator light,
Windscreen wipers and windshield washer control,
Speedometer,
Outside temperature,
Hour meter on all vehicles with a PTO,
Headlight's switch,
High beam headlight switch and indicator,
Master ignition switch,
Rear view mirrors,
Turn signal control and indicator lights,
Rear View Parking Camera Kit,

Two way radio mounted in cab with an extension mike and speaker for pump operator,
All meters shall be calibrated in metric units in accordance with the "Act on Measuring Units and National Measuring Standards (Act 76 of 1973)".

The following shall be mounted, provided with each vehicle:

Number plate brackets (front and rear),
Bumpers,
Mudguards (front and rear),
Emergency triangles in accordance with the Road Traffic Act, Act 29 of 1996, and,
Jack, wheel spanner and any specialized tools applicable to the vehicle.

The following additional controls shall be fitted in the cab:

"FIRE PUMP/PTO" Control and warning light,
"LOCKER CLOSED/OPEN" Warning light,
"LOCKERS LIGHT" Master isolating switch,
"EMERGENCY LIGHTING SYSTEM" Switch and warning light,
"SIREN AND PA SYSTEM" Control box with microphone,

The Interior of cab shall be neatly finished with automotive finishing materials. Emphasis must be placed on crew safety, and ease of maintenance.

1.10 ROAD ABILITY: PERFORMANCE AND ACCEPTANCE TESTS

The appliance when fully equipped and loaded shall be capable of the following performance while on dry, paved roads that are in good condition.

The appliance shall be able to attain a true speed of at least 60 km per hour within 60 seconds from a standing start on a level ground.

The appliance shall be able to attain a minimum top speed of 115 km per hour on a level road.

The appliance shall be capable of being driven off smoothly from rest up a gradient of 1 in 4.

The appliance shall be capable of being driven at a constant speed of 90 km per hour for a distance of 30 km without any portion of the power train or cooling system overheating.

The appliance shall be capable of maintaining, over a distance of at least 1 km, a forward speed of not more than 5 km/h without the engine performance becoming rough or irregular and the engine becoming overheated.

The stability of the appliance shall be such that when stationary and fully laden, it shall not overturn when tilted to either side to an angle of 35 degrees from the vertical.

The service and parking brakes shall be tested to ensure compliance with the requirements of SABS 1051, part 1-VI and complying to the National Road Traffic Act.

The service brake system shall be capable of full recovery within three normal applications after the vehicle has negotiated pooled water to depth of at least 50 mm, over a distance of 50 m and at speeds of at least 60 km/h.

NOTE: These standards are the minimum requirements, and it is expected that the performance of the vehicle will exceed them by a significant margin.

The pump must be capable of delivering the guaranteed output of the manufacturer for a minimum period of two (2) hours continuously. During this test the water in the engine cooling system must not require replenishment and the temperatures of the engine lubrication oil and coolant water must not exceed the safety limits specified by the manufacturer.

The primer must be capable of lifting water for at least 3 metres within 8 seconds and 7 metres within 20 seconds.

1.11 SERVICEABILITY:

The apparatus shall be designed so that the entire manufacturer's recommended routine maintenance checks of lubricant and fluid levels can be performed by the operator without lifting the cab of a tilt-cab apparatus or without the need for hand tools. Apparatus components that interfere with repair or removal of other major components shall be attached with fasteners, such as cap screws and nuts, so that the components can be removed and installed with ordinary hand tools. These components shall not be welded or otherwise permanently secured into place.

Where special tools are required for routine service on any component of the apparatus, such tools shall be provided with the apparatus.

1.12 ENVIRONMENTAL CONDITIONS:

The vehicle will be required to operate continuously in ambient temperature that will range from - 5°C to 40°C - and elevations of up to 1 400 m above sea level.

All components selected for the manufacture of the equipment shall be suitable for operation within the stated temperature range.

The cooling system shall be protected against corrosion by an approved additive to the cooling water.

2. APPARATUS BODY SUB-FRAME

An apparatus body sub frame shall be manufactured to carry the weight of the superstructure and the water tank and shall be mounted according to the chassis supplier's approval. The entire superstructure shall be manufactured using materials that offer the following features:

- Light weight
- Low maintenance
- Corrosion resistant
- High strength

The body shall be fully enclosed and shall provide sufficient storage for equipment. The design of the vehicle shall take into consideration the need to ensure that all equipment, whether loose or fixed, will remain in a secured position during travel.

3. LOCKER COMPARTMENTS

The fire fighting superstructure shall be fitted with six (6) body compartments that must be as low as possible and the layout shall be as follows:

- One compartment behind the crew cab and in front of rear wheels with full height roller shutter doors, one on either side of the unit.
- One smaller compartment above the rear wheels with full height roller shutter doors, one on either side of the vehicle.
- One compartment behind the wheels with full height roller shutter doors, one on either side of the unit.
- One compartment at the rear of the unit will house the rear mounted pump.

All compartments, except the rear, shall be equipped with at least one adjustable shelve that can hold a load of no less than 45 kg. In addition to this all the side compartments shall also be fitted with a bottom slide out tray to allow easy access to the equipment. Steps recessed in the

body or alternatively foldable steps shall be provided where the storage shelves are too high to reach the equipment.

Access handrails shall be provided at all positions where steps or ladders for climbing are located.

Any enclosed external compartment shall be weather resistant, well ventilated and have provision for drainage of moisture. An aluminum drip rail shall be fitted above each compartment opening.

The interior of each compartment shall be illuminated for night work. Each compartment shall be provided with a minimum of one (1) lamp. The positioning of the lighting shall ensure maximum light distribution within the compartment and be protected to prevent damage. Users must be able to switch the compartment lights on manually in the cab.

Fold down steps or similar shall be furnished to ensure ease of access to the locker compartments. The design of this shall be cleared by the chief fire officer before commencement of the project.

4. EQUIPMENT MOUNTING:

The equipment as specified for this type of vehicle shall be mounted with non-corrosive heavy-duty brackets.

Equipment shall be stored in a way that it can easily be mounted and removed without risk or injuries.

The equipment brackets shall be designed so that the equipment remains in position under all vehicle-operating conditions.

The tenderer shall submit a drawing indicating the storage location of each of the specified equipment pieces.

5. ROLLER SHUTTER COMPARTMENT DOORS

All compartments of the vehicle shall be provided with weather and dust proof anodized aluminum spring-loaded roller shutter doors, which shall be fitted with dual type, heavy-duty, positive locking mechanisms. Two keys shall be supplied with each locker.

The compartment doors shall be fitted in a flush style so that the entire door fits flush against the apparatus body sides. The roller shutter doors shall be fully enclosed within structural members and shall not obstruct the clear door opening.

Dust and waterproof light-alloy roller shutters. The dual-skinned design guarantees that the roller shutter can always be opened, also if e.g., a tool has come off its brackets, which normally would block the roller shutter. The profiles are embedded in a special type of plastic material, extremely low on noise, and smooth running. When opening a roller shutter, an automatic switch ensures immediate illumination of the respective locker.

6. WATER/FOAM TANK

A water tank with a minimum capacity of 3000 ℓ is required. The tank shall be manufactured from polyethylene.

Fitted with a 200lts foam tank plenished to capacity. The foam tanks shall be manufactured from heavy-duty polyethylene.

The mounting of the tank shall be so designed as to allow for the removal of the tank with minimal disassembly of compartments or panels. The tank shall be attached to the chassis by stress relieving flexible mountings. The method of mounting must take into account the importance of preventing any forward movement, particularly in the event of an accident. The tank must be constructed and mounted in such a manner as to achieve the lowest possible centre of gravity.

The tank shall be suitably baffled to prevent surge whilst the vehicle is in motion and shall be provided with an antivortex plate over the connection to the pump. An inspection plate large enough to allow for inspection of the entire tank must be provided and an overflow tube of a larger cross section than that of the filling pipe shall be installed. The overflow tube shall be so positioned and baffled to prevent loss of water due to surge and tilting. The overflow tube shall discharge any overflow behind the rear wheels and beneath the chassis.

Suitable tank electronic and non-electronic content gauges must be installed at the pump operator's panel. If a vertical transparent tube is provided as a tank content gauge, such tube is to be extending at least 100 mm above the tank but not protrude above top decking.

Suitable two hydrant filler inlets, with 64,5mm male couplings and female blank couplings, located on either side of the vehicle and provided with 64,5mm butterfly valves.

6.1 FOAM PROPORTIONING SYSTEM

An around the pump foam proportioning system must be provided for the purpose of proportioning foam concentrates into the suction side of the fire pump.

The system must be capable of producing foam solutions at all discharge outlets simultaneously when in operation.

The Foam system shall be controlled from the pump operator's position and must have a system control panel to include the following three controls:

- System on/off control valve
- Flush on/off control valve
- Foam source control switch

The proportioning system shall be capable of proportioning foam concentrate in accordance with the foam concentrate manufacturer's recommendations for the type(s) of foam concentrate(s) used in the system over the system design range of flow and pressures.

The foam system shall be in compliance with the current applicable sections of NFPA 1901.

Manufacturers pre delivery tests, e.g., *Priming device test certification, Vacuum Test according to manufacturer's specifications to be provided.*

7. TANK LEVEL GAUGE

Electronic and non-electronic tank level gauges furnished at the rear side of the tank around the pump operator's panel are required.

8. FIRE FIGHTING PUMP – REAR MOUNTED

A dual purpose, multi-stage, centrifugal pump complying with the following minimum capacities is required.

4 000 ℓ per minute at 1000 KPa at a lift of 3 meters. The high-pressure capacity of the pump shall be 400 ℓ/min at 4 000 KPa.

The pump shall be fitted with an automatic pressure control device.

The pump shall be driven by the vehicle's main engine through a PTO. The engine and PTO shall provide sufficient horsepower and RPM to enable the pump to meet and exceed the specified performance. The pump must be rear mounted.

The high-pressure pump body shall be of aluminium alloy BS1490 LM25TF and be hard anodized with PTFE impregnation to resist corrosion and erosion. The low-pressure volute shall be of aluminium alloy BS1419 LM25TF.

The pump shall have no less than two impellers and be capable of simultaneous multi-pressure operation.

The pump shall have an internal pressure relief system to ensure that the high pressure cannot exceed 55 Bar regardless of pump speed.

The pump shall include a thermal relief system to ensure that pump water temperature cannot exceed 50°C.

A filter shall be installed before water gets into the pump and shall be easily accessible for cleaning from the suction tube end of the unit.

When high pressure is not required low-pressure water must be automatically available at the high-pressure discharge outlets.

The pump shall be fitted with an electric rotary primer.

The pump shall have a compatible inlet with a round thread connection and nonferrous conical filter, which shall be removable. The pump will be fitted with four (4) 65 mm instantaneous outlets complete with pressure release lugs. The deliveries shall be provided with blank caps, which must incorporate means for relieving the pressure between the valve, and the cap.

A three-way collecting head for connecting to the pump inlet shall be provided and shall be fitted with 64.5 mm nominal diameter male instantaneous couplings and female blank caps on chains. In addition, a round thread female to 65 mm male instantaneous coupling adaptor to be provided.

Four (4) reinforced suction hoses, each at least 2.5 metres long and with an internal diameter to suit the pump shall be provided. The connections shall be of the round thread type compatible with the pump inlet. A metal and basket strainer and four (4) universal type suction wrenches shall be provided. The suction hose to be securely accommodated in racks constructed of extruded aluminum.

9. HOSEREELS

Two corrosion proof electric rewind hose reels with manual override complete with at least 60 m x 19 mm I.D. high-pressure hose, terminating in a trigger operated high-pressure nozzle shall be supplied. **NB:** Hosereel to be of sufficient size to accommodate 60 m of 19 mm high pressure hose. The nozzle shall be capable of handling pressure up to 45 Bar and shall have a selectable flow rate of 50 – 95 – 150 – 230 ℓ /min. Each nozzle shall be supplied with a removable foam tube to supply foam when utilizing the on-board foam system/s. The reels shall be fitted in rear lockers one on each side in the lower section of the compartment. The reels shall be coupled to the high-pressure side of the pump through clearly labeled control valves at the pump panel.

All high-pressure hose couplings including the coupling at the flow connection from hosereel to be hermaphrodite high-pressure couplings. Couplings to be secured with suitable clamps rated to withstand a pressure exceeding that of the maximum operating pressure of the high-pressure hose.

The hosereels shall be provided with automatic braking devices to prevent movement of the reel due to surge in the hose line.

Hose reels shall be supplied with an additional 30m extension high pressure hose (I.D 19mm)

10. PUMP OPERATORS PANEL

All gauges and controls for operating the pump shall be installed on a pump operator's panel, which shall be installed at the rear of the vehicle.

The following gauges, controls, valves, and equipment shall be located on or in the vicinity of the panel and these shall be clearly labeled:

- Compound gauge. Large diameter with positive side calibrated in kPa and negative side calibrated in metres water column (lift).
- Pressure gauges. Large diameter calibrated in kPa for main pump and hose reels.
- Accelerator control unit. (Electronic)
- Engine tachometer.
- Engine ammeter.
- Hour meter
- Engine temperature gauge calibrated in °C
- Oil pressure gauge calibrated in kPa.
- Pump compartment lights and switch.
- Water tank level indicator.
- Tank to pump control valve or switch.
- Hose reel control valves.
- Pump inlet and deliveries with shut-off valve and pressure relief valve.
- Power take-off pilot light.
- Tank fills valve controls.

11. ROOF/DECK MONITOR

One compact and light weight electrical remote-controlled monitor shall be fitted on the roof of the vehicle. The monitor shall be resistant to saltwater, foam agents, acid and aggressive environments.

The monitor shall be controlled via a joystick, remote control and manually. The joystick shall be a progressive, optical type winch allows for slow movement and very precise positioning. The joystick unit shall communicate via a Canbus cable and protocol.
Roof monitor is designed for both water and foam use. A swivel-out foam barrel allows the foam expansion quality to be greatly enhanced.

Flow rate: 3000 to 8000 l/min at 10-16 bars
Rotation: 360° infinite
Tilting range: - 50° through + 80°
Jet type: Spray or full jet, continuously adjustable

Throw range: water: up to 70 m

Fitted with an indicator which will flash and emit a sound when the monitor is not fully positioned on its original position.

12. GROUND SWEEP NOZZLES

Ground sweep nozzles shall be fitted to protect the vehicle.

13. PLUMBING

All rigid piping shall be designed to not cause any obstruction and limit friction and pressure loss to a minimum. The successful tenderer shall ensure that all piping is hot dip galvanized inside and outside.

13.1 TANK TO PUMP PLUMBING

A suction valve shall be furnished from the tank to the pump. This valve shall have a flexible connection and be enclosed in the pump compartment.

Plumbing compatible to external supply for both roof monitor and hose reel.

13.2 TANK FILL VIA PUMP FROM OPEN SOURCE

Provision shall be made for a fill line from the pump to the tank to enable users to fill the tank from the pump via the pressure outlet of the pump. Said fill line shall be ball valve operated.

14. FINISH

14.1 SLIP-RESISTANT WALKWAY SURFACE

All exterior surface areas to be utilized for stepping, standing, and walking shall have an aluminum tread plate slip-resistant finish.

14.2 REAR ACCESS

One rear access ladder shall be provided and mounted on the rear of the apparatus body to provide easy access to the roof of the vehicle. Grab handles will be fitted in all required positions.

14.3 RUBRAIL

A rub rail shall be fitted along the entire length of the rear body, both sides of the vehicle, for protection.

15. ELECTRICAL

A 12/24 Volt electrical system is required. The vehicle shall feature a battery master switch capable of cutting all power to the vehicle. This mechanism shall be within easy reach of the driver.

All batteries shall be of the low maintenance, high-cycle type.

Each vehicle shall be fitted with an alternator capable of maintaining the additional electrical equipment as stated in the requirements. It should be noted that these vehicles could be stationary for long periods of time with the warning and vehicle lights in operation.

All electrical wiring shall conform to a recognized code of practice acceptable to the purchaser. All circuits shall be protected by means of fuses or circuit breakers that can be reset or replaced. All electrical circuits shall be adequately colour-coded, marked and harnessed.

All exposed electrical wiring harnesses shall be supported and attached to body members, along the entire run. At any point where wire or looms must pass through metal, rubber grommets shall be installed to protect the wire from abrasion.

Full and comprehensive wiring diagrams shall be included with the technical manuals.

All switches shall be marked with a label indicating the function of the switch.

An electronic backup alarm shall be provided for self-propelled vehicles with a greater GVWR of 10 tones.

Where batteries cannot be easily reached after building of the bodies on the chassis/cab, the batteries shall be re-mounted on built slide-out battery trays in order to afford easy access to the batteries for maintenance purposes.

15. 1 ELECTRONIC SIREN AND PA SYSTEM

As a minimum, a three (3) tone siren with Hyper, Yelp and auxiliary tones with a hardwired microphone, PA system and speaker shall be provided and mounted in the cab.

15. 2 STEP AND GROUND LIGHTS

All work areas, steps and walk areas around the fire engine shall be properly illuminated

15. 3 ROOF MOUNTED LIGHTING SYSTEM

An emergency lighting system shall be fitted on the roof of the vehicle. The lighting system shall feature at least 4 x 500-watt lights, mounted on a robotic arm of approx two meters in length.

The system shall be remote controlled with controls either mounted in the cab or the locker just behind the cab. The light mast shall be electronically controlled using the vehicle power supply. Provision shall be made for the manual override if electronic controls fail.
Power to the halogen lights shall be via a generator.

The remote control shall have the following functions:

- Extension of mast
- 360-degree Rotation of the 4 lights
- Switching lights on and off
- Automatic park function of the system

A minimum of 4.5kVa generator shall be supplied with the vehicle. The generator shall be mounted in the rear left side locker on a slide out tray.

16. EMERGENCY LIGHTING

The apparatus shall have the following emergency lighting equipment

16. 1 LIGHT BAR

At least One (1) emergency light bar mounted on chassis cab roof.

16. 2 REAR EMERGENCY LIGHTS

At least Two (2) red rotating lights shall be mounted on either side of the rear of the body.

16.3 REAR

Two chrome plated deck spotlights shall be furnished.

To give warning of rearward motion, and in addition to the vehicle's reverse lights, the vehicle shall be fitted with an intermittent audible warning device capable of emitting a sound and rear-

view camera which shall be automatically activated when the reverse gear of the transmission is selected with the engine running.

17. PAINTING

17.1 WHEEL PAINTING

The exterior faces of the front and rear wheels shall be the standard color from the factory.

17.2 PAINT BODY TO MATCH CHASSIS

The apparatus body shall be painted Fire Red RAL 3000.
The body exterior shall be free from any mounted components prior to painting.
The vehicle chassis shall be painted black. The following coats of paint shall be applied.

Two coats of primer
One coat of universal primer
Two layers of final coat

17.3 LETTERING AND REFLECTIVE SAFETY STRIPE (cooperate affairs to be consulted)

White reflective 3M striping shall be fitted to the vehicle. This striping shall be 100mm wide with a 25m gap on each side of the 100mm stripe and 25mm wide stripe each side of 25mm gap.

The vehicle shall be equipped with reflective trimming as stated in the latest road safety ordinance.

Sign writing to the satisfaction of the chief fire officer shall be fitted each side of the vehicle.

18. MISCELLANEOUS

18. 1 SIGNS AND LABELS

All labels shall be in English.
A vehicle data plate shall be fixed in the door of the vehicle.
A pump data plate shall be fixed in the pump compartment.
Instruction plates shall be fitted at all points of note on the superstructure.
Tyre pressure labels shall be placed above all wheels indicating advised tyre pressure.

19. LADDER RACK

A hydraulically operated aluminum ladder rack shall be installed on the offside of the apparatus. This shall permit storage of the ladders above the hose bed, allowing for high side compartments and for easy removal of the ladders at ground level.

An interlock shall be provided that prevents operation of the ladder rack unless the parking brake is set. With vertical or horizontally hinged doors, interlocks shall be installed to prevent raising or lowering of the rack while the high side compartment doors are open.

The centre mount rack shall utilize an air cylinder to lock the rack in the nested position.

The ladder rack shall be controlled from the side pump panel area on the same side as the rack. The outward side of the ladder rack, when in the travel position, shall have a white reflective stripe for increased visibility.

The hydraulic cylinders area of the hydraulic ladder rack shall be covered with an aluminum diamond plate door.

19.1 LADDERS

One (1) x 7.3m two section aluminum extension ladder and one (1) x 4.8m roof ladder shall be fitted to the ladder rack of the vehicle.

20. FIRE FIGHTING EQUIPMENT

The following additional firefighting small equipment shall be supplied with the vehicle and shall be securely mounted in the locker compartments and ladder rack. All equipment offered on the tender shall be included in the tender price.

5 x Fire fighters rechargeable intrinsically safe torches
5 x Self Contained breathing apparatus sets (light composite material)
5 x Self Contained Breathing apparatus mask bags
5 x Distress signal warning units
5 x Spare breathing apparatus cylinders
1 x Electronic BA Control Board including 12 Tally Tags
1 x BA Cylinder Tester
1 x Air Bag Arrestor
4 x Branch Pipes multi force task (Pistol Type – Akron or similar type)
1 x Cellar Branch Pipe
2 x Ship fire fighting nozzle

1 x Controlling Dividing Breeching
1 x Collecting Breeching
1 x 5kg CO^2 Extinguisher (According to revised SABS 1910 standard)
2 x 9kg Dry Powder Extinguishers (According to revised SABS 1910 standard) 1
1 x 9kg Metal Fire Dry Powder Extinguisher Complete
with extension pourer
2 x Round Thread Standpipes
1 x Ratchetting hydrant wrench for tamper proof hydrant heads
2 x Hydrant Keys and Bars for underground fire hydrants
4 x Fireman axes with insulated handle ± 330 mm long
16 x Length 65 mm Rubber (Duraline or similar) Hoses
4 x Length 45 mm Rubber (Duraline or similar) Hoses
1 x 30 mm Life Line Complete with Safelock Hook in Bag
1 x 30 mm Heaving Line in Bag
1 x Spare High Pressure hose reel nozzle
1 x F225 Foam Inductor Complete with Pickup Tube
1 x F225 Branch Pipe
2 x 25l AFFF AR Foam
1 x 5.5 kVa Generator with Suitable Exhaust Ventilating System
2 x Rubber Hose Ramps
1 x Oscillating ground Water Monitor
1 x Abrasive Cutter
1 x Chainsaw
1 x Jaws-of-Life Spreader Unit (TNT or similar with lifetime guarantee)
1 x Shears Unit (TNT or similar with lifetime guarantee)
1 x Medium Ram (TNT or similar with lifetime guarantee)
1 x Small Ram (TNT or similar with lifetime guarantee)
1 x Petrol Motor – Rescue Unit
1 x Set Hydraulic Hose (with safety lock on snap on couplings)
1 x Mini-Cutter (TNT or similar with lifetime guarantee)
1 x Set Aircraft Tips (TNT or similar with lifetime guarantee)
2 x 3m Chains Complete with Hooks
2 x Hooks Complete with Shackles
2 x Spare Tips for Shears
2 x Spare Tips for Spreader
1 x Foot Pump
1 x Halligan Tool

1x Floating Pump
1x First Aid Jump Bag Complete
1x Spinal Board with head immobilizer
1 x High Rise Rescue basket with harness (Stoke stretcher)
10 x Road Cones (Marked FIRE)
2 x Gas Detectors (4 x gas sensors, i.e. oxygen, carbon monoxide, hydrogen sulphide & combustible gases)
4 x Gas Tight Suits (Fully encapsulated suit)
4 x Chemical Splash Suits
2 x Fire Proximity Suits
1 x PPV – Positive pressure ventilation (Diesel driven)
1 x Short length 65mm rubber fire hose (Duraline or similar)
1 x Smoke machine
1 x Thermal Image Camera
1 x Trapped Person Locator
1 x Vernon Morris Flow Meter
1 x Window Puncher and Seat Belt Cutter
1 x Set of vetter air bags
1 x Set of body bags
1 x Pair of long high voltage rubber working gloves
1 x full set of abseiling gear including small gear e.g., carribeanos, figure of eight, kernmantle ropes, safety harnesses, abseiling helmets, etc.

20.1 SUCTION STRAINER

Two (2) 100 mm suction hose strainer.

20.2 SUCTION HOSE SPANNER

Four (4) suction hose spanners

20.3 HARD SUCTION HOSE

Four (4) X 2.5-meter suction hoses to fit inlet of the fire fighting pump. Hard suction hoses will be mounted in cradle type brackets on the top deck of the superstructure.

20.4 THREE WAY COLLECTING HEAD

One (1) three way collecting head shall be supplied to fit the suction side of the pump.
One (1) four-inch stortz collecting head.

21. PREPARATION FOR DELIVERY:

Before final inspection, the vehicle shall be fully prepared for delivery. Delivery shall include:

Loose Items:

i) A checklist shall be prepared identifying all loose items.

ii) All loose items to be loaded into stowage boxes where applicable.

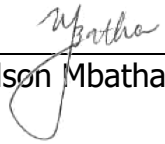
iii) All loose items shall be securely stowed in an approved manner.

A Pre-Delivery Service shall be carried out, this shall include:
All grease-points, lubricants and coolants shall be checked and corrected if required.
Checks shall be made to ensure that all cables are secured.
Checks shall be made to ensure that all electrical circuits are operable.
Tires shall be inflated to recommended pressures.
The vehicle shall be cleaned both internally and externally.
Wheel nuts shall be torqued to manufacturer's specifications.

SIGNATURES:

Reviewed by:  29/07/2022

Sazi Ndlela Date

Approved by:  29/07/2022

Nelson Mbatha Date