NKANGALA DISTRICT MUNICIPALITY

PROJECT NUMBERS:154168: SUPPLY, REGISTRATION AND DELIVERY OF 4X4 MEDIUM PUMPER FIRE ENGINES FOR DR JS MOROKA FIRE STATIONS

SCOPE OF WORK

Part C3: Scope of Work

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TECHNICAL SPECIFICATIONS: 4x4 MEDIUM PUMPER WITH REAR MOUNT PUMP

1. SCOPE:

This specification provides for the supply and delivery of a 4x4 Medium Pumper. The tender scope provides for the vehicle and the supply and mounting of equipment thereon (where applicable).

2. COMPLIANCE SHEET

A detailed compliance sheet must be submitted with the tender. Tenderers stating only yes/no will be disqualified. The format of the compliance sheet shall be as follows:

Note: This is just an example and not part of the specification

Item Number	Specification requirement	Comply Yes/No
1	The pump delivery shall be at least 3000 l/min	Yes

3. EQUIPMENT AND ACCESSORIES:

The successful tenderer(s) shall offer a complete vehicle including all the equipment and accessories where applicable and shall be responsible to have such items supplied and fitted.

4. STATUTORY REQUIREMENTS

The vehicle on offer will meet the following statutory requirements:

South African National Road Traffic Act
EN codes where applicable
NFPA codes where applicable

5. MANUALS:

The successful tenderer shall supply with the vehicle manuals for the vehicle as well as the accompanying equipment. The following shall be applicable:

a) One (1) only operator's manual

b) Individual vehicle service book.
c) One (1) only maintenance manual
d) One (1) only spare parts manual

6. WARRANTY:

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

The warranty period shall commence from the official date in service applicable to the vehicle and the minimum warrantee shall be as follows:

Chassis	Supplier OEM
Fire Body	3 Years
Paint	3 Years
Plumbing	3 Years
Pump	2 Years
Water and Foam Tanks	1 Year

7. DRAWINGS:

Detailed drawings must be submitted with the tender. The vehicle weight calculations must be clearly indicated as well as wheelbase, under body clearance, approach and departure angle, length of vehicle, height of vehicle and width of vehicle as a minimum. – **No exception (Tenderers who fail to submit drawings will be disqualified)**

The center of gravity should also be clearly indicated.

8. TESTING:

The following tests must be carried out and certification provided upon delivery where applicable:

Complete Operational and road test

9. INSPECTION OF VEHICLES:

Provision shall be made for two inspections for two officials, the first inspection being a pre-production meeting and the second inspection on the completed vehicle at the manufacturing plant of the successful tenderer(s).

If the successful tenderer requires any additional inspections, it must be clearly indicated in the tender documents. All of the above shall be for the account of the successful tenderer.

11. TRAINING

Comprehensive driver operator training is to be provided by the successful tenderer at the premises of the client or a suitable venue. **The cost of the training shall be included in the tender price. A minimum of 12 drivers should be catered for. Training should be accredited by a recognized Institution and successful learners must be issued with certificate.**

12. CHASSIS

12.1 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.

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.

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

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

The wheelbase of the vehicle shall be as short as possible.

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 body 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 4,000 mm.

The vehicle offered shall be a 4 x 4 all terrain vehicle.

12.2 BULL BAR WITH WINCH

The cab shall be fitted with a polished stainless-steel bull bar to the front of the nose. An 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 motor must be reversible and controllable by a disc brake. The remote control for the winch shall be securely stowed in the cab.

12.3 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.

12.4 SUSPENSION

The vehicle offered shall have a Manufacturer's Gross Vehicle Mass (GVM) rating of no less than 14 000 kg.

12.5 ENGINE

The vehicle offered shall have a power output of no less than 205 kW (280 hp) at 2,300 r/min. the engine shall be at least a Euro 3 engine.

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.

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.

A six cylinder 4-Stroke intercooler turbocharged diesel engine with direct injection and pressure lubricated is required.

12.6 TRANSMISSION

The vehicle shall be fitted with a factory fitted fully automatic transmission complete with retarder. **Semi-automatic or synchromesh will not be accepted**.

12.7 CREW CAB

A four-door cab accommodating a driver passenger and four additional crew members, is required. The crew cab shall be constructed to ensure optimal safety and comfort for the crew and be a complete one t piece design. The rear section of the crew cab shall be manufactured from GRP. (Glassfiber Reinforced Plastics)

All seats shall be fitted with SABS approved seat belts. The extended separate crew cabin shall be equipped with a bench seat fitted with four (4) quick release breathing apparatus backrests.

Grab handles shall be fitted to the sides of the cabin to assist crew when climbing into the cab. A full width padded crash bar shall be fitted. The cab shall be fitted with roof mounted internal lightning.

Storage facility shall be provided in the following areas in the cab:

a. Between the driver and crew spanning the width of the cab.
b. Pigeon hole type storage compartments fixed to the roof.

The crew cab will have doors of the forward hinged type with roll down windows.

All doors shall be lockable. A safety glass front windscreen shall be fitted. Access to the cab shall be via steps covered with non-slip tread plate. The steps shall form an integral part of the cab.

SABS approved large outer rear mirrors shall be fitted to the cab.

The cab shall be fitted with a heating, and ventilation system. All loose equipment carried in the cab shall be secured.

Mud flaps conforming to SABS standards shall be supplied and fitted.

The following fire fighting controls shall be installed and positioned in the cab in easy reach of the driver:

- PTO engagement with warning light
- Bar light switch
- Warning device switch
- Master locker lights on switch

A battery master switch must be fitted on the vehicle

13. 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.

14. LOCKER COMPARTMENTS

The fire fighting superstructure shall be fitted with seven (7) body compartments 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 wheels 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 45 kg. In addition to this at least two side compartments shall also be fitted with a bottom slide out tray to allow easy access to the equipment. The area over the wheel arch shall be a fold down step for easy access.

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 LED strip illumination. 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.

15. 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 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.

Color of the rollers doors must be black

16. WATER AND FOAM TANK

A booster tank with a capacity of 4000 liters shall be installed on the vehicle. An additional 300-liter Class B foam tank shall be provided. The foam and water tank shall be an integral unit.

The booster tank must be designed to be completely independent of the body and compartments. The booster tank shall be manufactured of GRP and must be mounted along the length of the vehicle in the centre along the chassis rail on suitable flexible mountings. Due to high corrosive water steel or stainless steel tanks are not acceptable. The position of the tank will ensure the lowest possible centre of gravity. It shall also be removable without dismounting the fire body.

The tank shall be baffled to minimize water surge during travel and enhance road handling stability and be provided with fixed baffling complete with breathable lid.

An overflow pipe terminating behind the rear wheels of the vehicle and below chassis height shall be provided.

The tank shall have at least a 25mm drain plug at the lowest point of the tank.

17. TANK LEVEL GAUGES

Electronic tank level gauges must form part of the electronic vehicle and pump management system specified in point 16

18. REAR MOUNTED FIRE FIGHTING PUMP

The vehicle shall be fitted with a multistage centrifugal pump with simultaneous normal and high-pressure capability and around the pump foam proportioning system of 1, 3 and 6 %.

It is mandatory that the pump carry a 5-year manufacturer's warrantee. Pumps not warranted by OEM manufacturer for 5 years will not be accepted.

The output of the fire pump shall be as follows:

NORMAL PRESSURE: 3000 lpm at 10 bar
HIGH PRESSURE: 400 lpm at 40 bar

The pump shall be securely mounted at the rear-side of the appliance and be driven from the engine chassis via a PTO (Power Take Off) and balanced propeller shaft.

The pump shall have one (1) suction inlet fitted with a blank cap secured with a chain to the pump. The pump shall also have four (4) 65mm discharges fitted with 65mm female British Instantaneous Couplings (BIC). Blank caps shall also be fitted to the discharges. The pump shall also have two (2) high pressure discharges for the Hose Reels. An additional line to a deck monitor shall be provided.

19. PUMP AND VEHICLE MANAGEMENT SYSTEM

An electronic vehicle management system shall be fitted, and the rear touch screen shall replace the pump control. The electronic touch screen panel shall be placed on the pump panel. The control must affect the following functions

- Pump rpm control
- Engine temp display
- Pump working hours display
- Vehicle battery voltage
- Engine oil pressure indication
- Pump service light warning
- Ground sweep activation
- Hose reel activation
- Roof turret valve open/close
- Tank to pump open/close
- Pump to tank open/close
- Foam level indication
- Water Level indication
- Ground light activation
- Locker light activation
- Deck light activation

In addition, the following analogue gauges will be fitted as a backup display of pressure:

Pump compound pressure gauge
Pump high pressure gauge
Normal pressure gauge

A second electronic control panel shall be fitted in the cabin and the screen shall have the following features.

- Door open warning
- Locker open warning
- Light mast extended warning
- Hydraulic ladder gantry warning
- Tank levels
- Reverse camera

20. FIRST AID HIGH PRESSURE HOSE REELS

Two standard 30m x 25mm internal diameter non-collapsible high-pressure electric rewind high pressure hose reels shall be supplied and mounted in the rear compartments one each side of the truck. A back-up manual rewind shall be fitted.

Each hose shall be fitted with an adjustable High-Pressure jet/spray branch pipe with foam attachment.

21. MONITOR

The vehicle shall be fitted with a manual water/foam monitor. The mounting of the monitor shall ensure sturdy fitment and operation. The monitor shall have a discharge capacity of at least 3000 l/min

22. 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 high grade stainless steel. A plumbing layout drawing must be provided upon the first production meeting for approval by the client.

23. TANK FILL FROM HYDRANT

A 65mm ball valve operated connection must be furnished to fill the tank form a hydrant. The connection must have a male 65mm BIC coupling and blank cap

24. FINISH

24.1 HARD SUCTION HOSE TRAYS

Two (2) 3m hard suction hoses shall be mounted in a fabricated aluminum compartment on the roof of the super structure. Suction hoses shall fit pump inlet.

24.2 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.

24.3 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.

24.4 RUB RAIL

A rub rail shall be fitted along the entire length of the rear body, both sides of the vehicle, for protection. Inside the rub rail there shall be at least 3 amber truck lights and Yellow SABS reflective tape

24.5 ELECTRICAL

A 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.

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.

24.6 ELECTRONIC SIREN AND PA SYSTEM

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.

24.7 STEP AND GROUND LIGHTS

Sufficient lights must be provided to illuminate the area around the vehicle. Step and ground lights must be fitted as follows:

2 Ground lights each side, Cool white LED angled downwards and fitted in Rub Rail.
2 Ground lights at the rear, Cool white angled downwards and fitted under vehicle.

2 x Step lights recessed one on each side of the cab step.

24.8 PNEUMATIC LIGHTING SYSTEM

A pneumatic light mast must be mounted through the roof in the front locker and be fitted with 3 x LED lights of at least 700 lumens each. The mast must be able to retract automatically once the handbrake is released.

24.9 EMERGENCY LIGHTING

The apparatus shall have the following emergency lighting equipment

24.10 LIGHT BAR

One (1) LED emergency light bar mounted on chassis cab roof. The light bar must be red with 4 X 6 LED D-Fuser corner light heads and 4 X 3 LED forward facing light heads and have a 1 x 100W Integrated Speaker

24.11 REAR EMERGENCY LIGHTS

Four (4) LED Red Flashers shall be mounted on either side of the rear of the body - Lights to carry lifetime warrantee

24.12 FLUSH MOUNTED SCENE LIGHTS

Six (6) LED Scene lights must be flush mount and installed around the vehicle as follows:

Two at the rear and two each side of the vehicle. The lights will be recessed on the sides and flush mounted at the rear

24.13 FLASHERS

Two (2) Red LED lights shall be mounted on each side of the vehicle body upper level – Four in Total
One (1) Red LED light will be fitted in the rub rail in the center of the vehicle lower level
Two (2) Red LED lights shall be mounted on the front of the vehicle

24.14 PAINTING

The apparatus body shall be painted red to specification of the chief fire officer. The colour code or a paint sample shall be supplied by the successful tenderer for approval by the chief fire officer prior to commencing with the painting of the vehicle.
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

24.15 LETTERING AND REFLECTIVE SAFETY STRIPE

White reflective 3M striping shall be fitted to the vehicle. This striping shall be 100mm wide.

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 and fire logo.

26. HYDRAULIC 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 cylinder’s area of the hydraulic ladder rack shall be covered with an aluminum diamond plate door. – to be finished same color as roller doors

26. MISCELLANEOUS

26.1 KEYS

Two (2) sets of keys shall be supplied upon delivery for the following:

- Ignition
- Cabin doors
- Locker doors

26.2 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.

26.3 ACCESSORIES

One (1) each of the following accessories shall be supplied.

- Vehicle hydraulic jack with handle
- Wheel wrench
- Pair of reflective triangles
- Tool roll

26.4 FIRE FIGHTING EQUIPMENTS PER FIRE ENGINE

The following Fire Fighting 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 indicated separately in the tender price.

Suction strainer	1
Suction wrenches	2
Hard suction hose 3m	2
Three way collecting head	1
Two section extension NFPA ladder - 7.3m	1
A-Frame ladder	1
Roof/Hook NFPA Ladder	1
Complete SCBA sets c/w composite cylinder	4
Spare Composite SCBA cylinders	4
Pistol Grip Nozzles	4
Dividing Breeching	1
Collecting Breeching	1
45mm x 30m Rubber Firefighting hoses c/w BIC couplings	20
Hydrant Standpipe c/w key and bar	2
Cross Type Hydrant Key	2
65mm hose ramp set	1
Low Expansion Foam Nozzle c/w inductor and tube	1
Medium Expansion Foam Nozzle c/w inductor and tube	1
Toolbox c/w tools	1

Felling Axe	1
Hooligan Tool	1
Pry Axe	1
450mm Bolt Cutter	2
900mm Bolt Cutter	1
Large crowbar	1
Small crowbar	1
Spade	2
Garden Fork	2
9kg DCP Extinguisher	1
CO^2 Extinguisher	1
Road Cones	20
Step Chocks set	1
Carborundum Cutter with Fire and Rescue Blade	1
Chainsaw	1
Reciprocating saw	1
Utility rope	2
Carabiners	4
Pulleys	2
Pike poles	1
Ascender	1
Rescue harness	2
Positive pressure ventilation	1
Salvage sheet	2
Jaws motor	1
Spreader	1
Shear	1
Combination tool	1
Extension ram(small,medium,large)	3
Rubber mallet	1
Sledgehammer	1