

Details of specification are as follows.

The successful tenderer will be solely responsible for the safe custody and proper maintenance of the chassis or any part thereof till the fabrication is completed and the vehicle is handed over to the ULB i.e. Municipal Corporation or Municipal Council with satisfactory test. The successful tenderer will have to complete the work as per specifications stipulated below and complete the vehicle in all respect to put into operation and ready to use.

The High-Rise Building Fire-fighting vehicle -200M shall be designed and fabricated as per the following specifications. Hereinafter while reading this specification it shall be called as said High Rise Vehicle. This standard lays down the requirement regarding Design, Material, Construction, workmanship, finish, accessories and acceptance test of High-rise building Fire Fighting Vehicle.

Note:

1. Wherever makes of any equipment is given it shall always be read in continuation word "or equivalent"
2. Wherever the numerical is used indicating dimensions of any equipment or material, tolerance of +/- 10% shall be accepted.
3. Wherever the items / equipment is mentioned having NFPA or EN requirement, for all those equipment, proper certificate regarding the same shall be supplied by the OEM / Fabricator.

On behalf of the Government of Maharashtra, The Commissioner & Director, Municipal Administration, Belapur, Navi Mumbai invites sealed tender offers (Technical and Commercial) from Manufacturer of Various Fire Fighting Vehicles as mentioned in the tender for to be supplied to various ULB"s in Commissioner & Director, Municipal Administrations.

1. The scope shall also include procurement of chassis and hence time limit for completion of work include procurement of chassis also.
2. The additional item that will be included in the tender shall be informed on so that all the participants agree to such additional cost due to replacement of the parts / equipment / device etc. Such item-cost shall be added as separate annexure to the tender in commercial tender for easy comparison.
3. **The vehicle to be procured will be for any destination in Maharashtra for the use of local fire service. It shall be obligatory for the Bidder to register the same in the name of ULB"s to which it has to be supplied.**



DETAILED TECHNICAL SPECIFICATIONS OF HIGHRISE BUILDING FIRE FIGHTING VEHICLE-200M

The High-Rise Building Fire-fighting vehicle -200M shall be designed and fabricated as per the following specifications. Hereinafter while reading this specification it shall be called as said High Rise Vehicle. This standard lays down the requirement regarding Design, Material, Construction, workmanship, finish, accessories and acceptance test of High-rise building Fire Fighting Vehicle.

GENERAL REQUIREMENTS: -

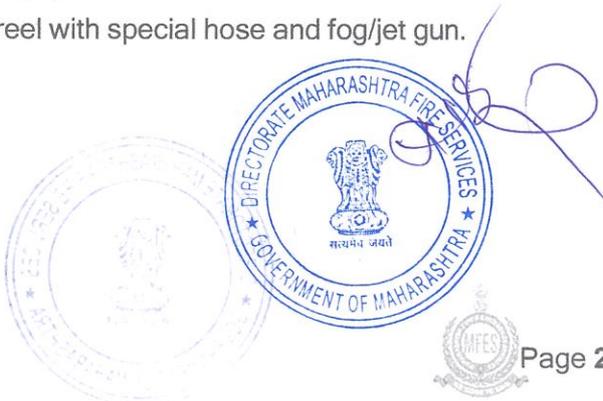
The High-rise building Fire Fighting Vehicle will incorporate a centrifugal type, multi pressure, having output capacity of 3000 LPM at 7 kg/cm² and 300 LPM at 35 kg/cm² at 3 mtrs. suction lift at NTP condition, a constant flow high pressure fire pump capable of giving a up to the height of 200 meters, a Water Tank of 6000 liters. along with various types of equipment"s & accessories as specified in this specification.

Note:

1. Wherever makes of any equipment is given it shall always be read in continuation word "or equivalent"
2. Wherever the numerical is used indicating dimensions of any equipment or material, tolerance of +/- 10% shall be accepted.
3. Wherever the items / equipment is mentioned having NFPA or EN requirement, for all those equipment, proper certificate regarding the same shall be supplied by the OEM / Fabricator.

A) SCOPE OF SUPPLY

- i. A Full Forward control suitable indigenous make, BS VI or latest complaint chassis having min. 4200 mm wheel base with fully furnished factory-built driver"s cabin.
- ii. Fabrication and mounting of 6000 Liters capacity water tank as per specification
- iii. Supply and mounting of High- & Low-Pressure centrifugal firefighting pump as per specifications.
- iv. Supply and mounting of constant flow high pressure fire pump with hydrostatic drive.
- v. PLC control system for firefighting system.
- vi. High pressure motorized hose reel with special hose and fog/jet gun.



B) USE

This vehicle will be used for boosting the water in high-rise buildings on higher floors (up to 200 meters.) when building inbuilt system is not working. The constant flow multi-pressure pump shall be able to give a min. flow of 200 LPM at pressure of 40 bar up to the height of 200 meter. The head of the pump can be selectable depending upon the height at which water need to be boost up.

C) DETAILED SPECIFICATIONS

1 CHASSIS

The chassis shall be a suitable Indigenous make Min. 18-ton GVW having min. 4200 mm wheel base with single driver"s fully furnished cabin as per following specifications:

- 1.1 Make of the chassis: Suitable indigenous make BS VI chassis.
- 1.2 Type: Full forward control, RHD, min. 4200 mm wheel base.
- 1.3 Engine: Inline, 4/6-cylinder, diesel engine developing Min. 170 HP BS VI, complying. (Original technical brochure to be attached). VRDE / ARAI certificate to be attached.
- 1.4 G.V.W.: Min. 18 ton as per CMVR.
- 1.5 Fuel Tank: Min. capacity of 200 Liters
- 1.6 Driver Cabin: Original factory-built Driver Cabin complete with two doors, ventilation fan, rear view mirrors, windscreen, side windows, doors, adjustable driver seat, fixed Co-driver seat, wiper system, Horn, complete instrument cluster.

2 CREW CABIN

- 2.1 The crew cabin shall be fabricated just behind the driver"s cabin and inline to accommodate 3 firemen.
- 2.2 The under frame cross members and runner shall be fabricated and made out of M.S. channel of 100X50X5 mm.
- 2.3 Each cross member shall be secured to the chassis frame by any suitable means.
- 2.4 The superstructure of the cabin shall be constructed from various types of GI of suitable size, which are joined together by means of solid and riveting or nuts and bolts. The superstructure shall be strengthened specifically on the members where the doors and window frames are to be fitted, by providing brackets and the gussets.
- 2.5 All the super structural members and under frame cross members shall be painted with two coats of rust preventive paint.
- 2.6 The complete external panelling of crew cabin, including doors shall be of 16 SWG aluminium sheet with all the joints riveted and bided except the roof of panelling which shall be of 2 mm. thick aluminium sheet with all joints riveted to the super structure by double row with solid rivets.



- 2.7 The complete internal panelling of crew cabin shall be of 18 SWG aluminium sheet properly riveted and bided to the super structural members.
- 2.8 The flooring of the crew cabin shall be fabricated from 3 mm aluminium chequered plates properly fixed to the under frame by means of nuts and bolts or riveting. Trap doors for topping up wherever necessary shall be provided.
- 2.9 The crew cabin shall be equipped with full two doors for the crew members.
- 2.10 The doors shall be fitted on the super structural members each hung upon the two/three numbers coach type hinges and fitted with best quality handles.
- 2.11 The window on all the doors shall be full lift type with winder mechanism.
- 2.12 The windows of crew cabin shall be provided with 5 mm. thick toughened safety glasses.

3 SEATS

- 3.1 The driver and officer seat shall be provided by chassis OEM.
- 3.2 The three crew members shall have individual seating, with each seat fitted with brackets for placement of Breathing Apparatus in an upright position.
- 3.3 The seats shall be of the wear & walk away type so that when the crew disembarks from the vehicle, the BA sets should easily come off the seats with them.
- 3.4 The seat bottom will be theatre type, which will automatically flip up when the fireman gets up, thereby freeing up space for easy embarking & disembarking.
- 3.5 The seats shall have integrated seat cushioning to isolate shock while in motion.
- 3.6 The seats shall accommodate all types of SCBA.

4 LOCKERS

- 4.1 Sufficient number of lockers shall be provided at both the sides of rear body for keeping suction hoses, delivery hoses, accessories, hose reels and other tools.
- 4.2 The lockers shall be arranged in such a manner that the load distribution shall be equal on both the sides.
- 4.3 There shall be lockers provided at the skirt level of suitable size on both the sides.
- 4.4 The lockers shall be divided into compartments and halves as per the requirement. The final design will be decided at the time of fabrication work.
- 4.5 Lockers shall be provided with Aluminium shutters including the pump compartment but excluding the lockers provided below the chassis level. The aluminium shutters shall be water tight with suitable rubber packing and shall be MCD/FIRECO make.

5 MISCELLANEOUS

- 5.1 One cat ladder made out of SS 304 pipe of 1" dia. shall be fixed at the rear.
- 5.2 1" dia. SS chromium plated pipe railing with sufficient number of brackets shall be provided to the rear body over the deck.
- 5.3 A wire mesh guard quick removable type shall be provided to windscreen glass.



5.4 Forcible Entry Hydraulic Tool - 1 Set

- 1) The hand operated hydraulic forcible tool should have a fully integrated to stage hydraulic pump.
- 2) The maximum work working pressure shall not be more than 700 bar.
- 3) The hydraulic forcible entry tool should be capable of being used as a hammer and it should be able to cut, spread, lift and wedge.
- 4) It should have a detachable hammer, when connected to tool should help with hydraulic functioning and if detached can be used as a hammer.
- 5) The tool shall be light weight and easy to use. The tool shall be capable to rotate 360° so that it is always in the ideal working position. Handle should be Fiber and insulated.
- 6) Spreading tips should allow for opening heavy, inward, opening doors, in a controlled way, with load-holding function for lifting and progressively lifting the cutting section of the tool so that it is capable to cut bar chain and lock.
- 7) Blade opening at the tips not more than 30 mm.
- 8) Blade opening not less than 200 mm
- 9) Maximum cutting force not less than 150 KN.
- 10) Spreading distance not more than 175 mm.
- 11) Minimum spreading force 25 mm from the tip shall not be less than 30 KN.
- 12) Cutting round bar (acc.to EN13204) shall not be less than 20 mm.
- 13) Weight of the tool not more than 9.5 Kgs.

OEM must have their factory & Service Centre in INDIA. OEM must have spares readily available of the tool for next 10 Years in INDIA.

6 WATER TANK

6.1 water tank shall be installed on the High Rise Vehicle. The tanks have the following parameters:

PARTICULARS	REQUIREMENT
Capacity	6000 ltrs
Material of Construction	MS
Bottom Plate Thickness	4 mm
Side Plate Thickness (Die Pressed Stiffened on Two Sides)	4 mm
Top Plate Thickness	4 mm
Baffles Thickness	3.15 mm
Number of compartments	Minimum 04 nos.
Numbers and Size of Manhole	1 x 450 mm



Numbers and Size of Cleaning Hole (Bottom of Tank)	1 x 250 mm
Drain Pipe on Cleaning Hole	25 mm
Overflow Pipe Size	100mm
Number of Tank Filling Connections	2 x 63 mm
Tank to Pump Line Size	Suitable to pump.

6.2 Design & Plumbing

- 6.2.1 The Water Tank shall be designed to carry approx. 2 % excess capacity of the designed capacity. The Water tank shall be so installed as to allow the full flow of water to the pump. The tank will have baffle plates in order to avoid surge when the vehicle is braking, accelerating and cornering.
- 6.2.2 The tank shall have a bolted manhole of 450 mm diameter of the same material as that of the tank and shall have cap of **200** mm diameter for filling the water tank from the top. The filler cap shall be clearly marked „WATER“ . The manhole cover shall be made from 5 mm thick plate of suitable metal.
- 6.2.3 Reinforcement & corrugation of the tank shall be done. Visual Level Gauge of the glass tube will be provided at the Control Panel Calibrated $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ & Full. Tank will be treated for anticorrosion by Sand Blasting and Min. 1 Coat of Primer and Min. 1 Coat of Epoxy Paint
- 6.2.4 All hardware / bolts used for the **water tank** shall be of Stainless steel SS304 only. The water tank with its piping and filament shall withstand hydrostatic pressure 0.3 bar
- 6.2.5 Suitable eyes will be provided on the shell of the tank to enable it to be lifted off the vehicle for repairs when required. The tank shall be fitted with a 100 mm sized overflow pipe. 2 X 63 mm instantaneous hydrant connections, incorporating a ball valve and strainer, shall be provided for filling the tank through 63 mm bore pipe work. Suitable size pipe line shall be taken from the tank to the suction inlet of the pump incorporating quick action spherical / butterfly type valve as per IS 13095.
- 6.2.6 The open end of the overflow pipe shall be taken down to a point well below the chassis without affecting the effective ground clearance when fully loaded and shall discharge away from the wheels.
- 6.2.7 A cleaning hole shall be provided at the bottom of the tank. It will be fitted with a drain pipe & valve which will be taken down to a point well below the chassis without reducing the effective ground clearance.



6.2.8 The tank shall be connected to the pump and hose reel in such a manner that pressurization of water tank or water tank-pump connection is not possible when pumping water from an outside source of supply.

6.3 Pipelines and Valves

6.3.1 All pipelines shall be of stainless steel grade SS 304 and all valves up to 50 mm size shall be 3 piece design grade 304 stainless steel ball valves. All valves above 50 mm shall be standard butterfly valves.

6.3.2 The piping shall be flanged for ease of maintenance. **Flanges shall have „O“ ring sealing.** However, flange joints shall be kept to minimum

6.3.3 All lines shall be hydraulically tested at 1.5 times of the design pressure and pressure shall be held for 2 h. In no case the lines shall be tested below 25 kg/cm²

6.3.4 All lines less than 50 mm size shall be socket welded to matching rating fittings.

6.3.5 All lines above 50 mm size shall be butt welded with full penetration welds

6.4 TANK MOUNTING SYSTEM

6.4.1 The water tanks will be mounted on the vehicle on suitable Rigid mounting with suitable number of mounts clamped with chassis by EN-8 U bolts wherever necessary. Tank will be mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The baffles will be arranged in a manner to facilitate easy cleaning of the tanks. The tank will be mounted on full length runner. The Centre of Gravity shall be maintained as low as possible.

6.5 SUBFRAME

6.5.1 Compartment Superstructure shall be mounted on secure brackets of the steel sub frame made from Anti-Corrosive Treated MS 4” section and shall be bolted with the chassis using the high tensile bolts. Use of “U” bolts as well as direct mounting of Superstructure on chassis frame is strictly non-permissible.

6.5.2 The Fire tender shall be so fabricated that Gross Weight of the vehicle shall not be more than as mentioned in Clause 01 above.



7 CENTRIFUGAL FIRE PUMP:

- 7.1 As on today there is no BIS standards are available for High-Low pressure Pumps, hence EN-1028 standards are considered for this work.
- 7.2 A Centrifugal high and low pressure fire pump made up of gun metal / stainless steel / aluminium alloy of Godiva OR Rosenbauer or Firefly make or any equivalent but complying to EN 1028, CE Certified and confirming to following features shall be mounted on the appliance
- 7.3 The pump shall comply following performance parameters.
- a) Normal Pressure output: 3000 LPM at 7 kgs/cm²
 - b) High pressure output: 300 LPM at 35 kgs. /cm²
 - c) Deep lifting capacity of pump: max. 45 sec. for 7 m depth.
- 7.4 The low-pressure side will be of single stage and the high-pressure side shall either be single or multi stage.
- 7.5 The pump should be Certified with EN -1028 Pump has to be tested & Certified by the International accredited organizations like TCE (Tata Consulting Engineering)/ EIL (Engineers India Ltd.) /TUV India/ SGS/ UL.
- 7.6 Pump manufacturer or the fire engine fabricator should have such testing facility as per EN -1028 at their own premises. It's the responsibility of manufacturer / fabricator to ensure for such test facility available with pump manufacturers.
- 7.7 The pump should be certified with EN- 1028, Pump of normal & high-pressure centrifugal type capable of delivering the requisite capacity at required pressure as mentioned in Clause 03 as mentioned for normal pressure and High pressure. The complete pump assembly shall be made of GM / SS/ Aluminium alloy.
- 7.8 The normal and high-pressure impeller shall be mounted preferably on a single shaft and impellers shall be dynamically balanced.
- 7.9 The gland shall be of the mechanical carbon / self-adjusting type.
- 7.10 The pump shall have facility to operate on various modes as per the requirement for firefighting.
- 7.11 Operation of low pressure to high pressure or vice-a-versa shall be possible by actuation of single lever/button.
- 7.12 The size of high-pressure outlet shall be of 25 mm connected to high-pressure hose reel.
- 7.13 The pump design shall be modular type and for ease of maintenance.
- 7.14 The pump shall be provided with one suction inlet having round threads confirming to IS:902 of 1974 and or EN standards three numbers of 63 mm delivery outlets having screw down type valves fitted with instantaneous couplings as per IS 903/1993 and or equivalent one 38 mm



delivery outlet with ball valve with female instantaneous coupling. The delivery valve screw shall not be with gland. The high-pressure outlet shall not be less than 25 mm and shall either be flange on screw type.

- 7.15 The pump housing shall have provision to connect to internal cooling system if required.
- 7.16 The pump shall be mounted at the suitable location connected to P.T.O. by propeller shafts and universal and slip joints with sufficient number of bearing supports.
- 7.17 All the valves used shall be of reputed make with all the piping of required size and shall be of SS material.

7.18 Pump Priming System-

- 7.19 The pump shall be fitted either with inbuilt twin piston / reciprocating / rotary vane / diaphragm / Pneumatic type priming system capable of priming the pump from 7 meters within 50 seconds at NTP conditions.
- 7.20 The entire priming system shall be constructed either in stainless steel or brass or bronze or aluminium alloy. Arrangement shall be made to actuate the primer in Manual and AUTO modes.
- 7.21 **When operating in Manual mode** primer should be engaged simply by pressing a single button, only when it is needed.
- 7.22 **When operating in Auto mode**, primer must be internally actuated and must automatically re-engage when pressure is lost.
- 7.23 However, in both operating modes the primer shall disengage automatically at a pump discharge pressure of not more than 0.8 bar.
- 7.24 The primer deactivation shall be controlled directly by a pump pressure sensing device

Bidder Should Submit OEM Authorization Certificate.

8.0 POWER TAKE OFF

- 8.1 A power take off assembly shall be brand new and capable of transmitting full torque developed by vehicle engine and transmitted to wheels shall be provided to drive the centrifugal fire pump.
- 8.2 A power take off assembly shall be reputed make having ratio of min. 1:1.42 or suitable and shall be able to transmit adequate torque.
- 8.3 The PTO control shall be Pneumatically operated with manual over ride located inside the driving compartment at suitable and easily accessible position.
- 8.4 The PTO assembly shall have a built-in cooling system.
- 8.5 The driving shafts between the main transmission and the PTO shall be fully universal with provision for lubrication and shall have spline and socket system at another end.
- 8.6 The PTO assembly shall be mounted preferably on heavy duty Rubber mountings. The mounting design shall be decided at the time of fabrication.



9.0 Constant Flow Multi-Pressure Pump:

9.1 A constant flow multi-pressure pump capable of delivering 250 LPM @ 40 bar outputs at nozzle on ground level as well as at 200-meter height (@ 60th Floor) shall be mounted in the vehicle. The pump shall be driven suitably through power take off and the output of this pump shall be connected to common high pressure hose reel.

Authorization letter and catalogue from manufacturer shall be attached with bid document otherwise bid shall be summarily rejected.

10.0 HYDROSTATIC DRIVE SYSTEM:

- 10.1 There shall be hydrostatic drive system provided for driving the constant flow very high pressure pump.
- 10.2 The hydraulic pump shall be driven by vehicle PTO which will be supplied by chassis either by chassis manufacturer or by body builder.
- 10.3 The PTO shall be of suitable capacity required to drive the reciprocating pump to meet the desired output criteria as stipulated above.
- 10.4 The ratio of the PTO shall be such that the engine is always running in safe mode as recommended by the chassis manufacturer.
- 10.5 The hydraulic system consists of hydraulic tank, filters, control valves, piping and oil cooler.
- 10.6 All the component of hydraulic system shall be of reputed make only such as Parker, Rexroth, Bosch etc.

11 CONTROL PANEL:

11.1 Pump Control Panel

11.1.1 The pump shall be fitted with Pump OEM fitted Control panel comprising following features:

- a. Digital Tachometer (optional)
- b. Digital Pump Hour Meter



- c. Digital as well as Analogue Vacuum (Compound gauge)
- d. Digital as well as Analogue Low and High Pressure gauges
- e. Pump prime button for Auto mode
- f. Pump prime button for Manual mode
- g. Oil Temperature warning light
- h. Electronic Water Tank Level Indicator
- i. Emergency Call Bell (optional)
- j. Audio Visual Alarm for tank indication (Optional)
- k. PTO engage lamp in driver"s cabin and rear control panel (optional)

11.2 The pump control panel shall be designed keeping in mind the ease of operation and maintenance. The system shall ensure that scheduled operations and preventive maintenance is easily possible.

11.3 It shall be ergonomically designed to ensure that all controls come to hand easily. The entire area shall be covered by roller shutters.

11.4 All controls of the system will be spaced properly & marked for easy operation. All valves will be of lever-operated type and will be made of SS with Teflon seats. The following controls shall be provided on rear side of the vehicle near the control panel:

- 11.4.1 Compound Gauge
- 11.4.2 Normal Pressure Gauge
- 11.4.3 High Pressure Gauge.
- 11.4.4 Engine Throttle Control (Auxiliary / Electronic)
- 11.4.5 Cooling Water Circuit Control
- 11.4.6 Hydrant Connections for filling water tank.
- 11.4.7 Pump Inlets and Outlets
- 11.4.8 Water Tank to Pump
- 11.4.9 Butterfly Valve - Pump to Monitor Valve
- 11.4.10 Operating Instruction Plate

11.5 The pressure gauges shall be of reputed make Glycerine filled with min 3" dia. panel mounted.

11.6 High pressure hose reel circuit control.

11.7 Change over lever from LP to HP mode located at convenient position.



11.8 LED type digital water level indicator calibrated on full, 3/4, 1/2, 1/4 and empty.

12 HIGH PRESSURE HOSE REEL WITH GUN:

- 12.1 One high-pressure hose reel shall be provided and fixed at suitable location. This hose reel shall be connected to centrifugal fire pump and to reciprocating high pressure pump. These hose reels shall be connected to H.P. out let of pump with reputed make butterfly/ball valve of suitable size.
- 12.2 The hose reel shall be motorized, driven either electrical or hydraulic. The hose reel shall be made from carbon steel/ Aluminium/ stainless steel material with bearings / bush made from gunmetal. There shall not be any gland sealing for the hose reel and sealing shall be done by means of either oil seals or 'O' rings.
- 12.3 The design and size of hose reel shall be such that, it shall accommodate 60 metres. H.P. hose having min. 25.0 mm bore with quick connect couplings. The H.P. hose pipe shall be made out of special water and grease resistant flexible thermoplastic co-polymer or flexible rubber material with minimum 25 mm I.D. The hose shall be light in weight and should not weigh more than 1 Kg. / mt. length and shall have minimum working pressure of 200 bars. The H.P. hose shall be of Reputed make.
- 12.4 The HP hose reel shall be provided with High Pressure fog / Jet trigger type gun of reputed make connect by quick connect couplings. The gun shall be made from aluminium alloy with rubber grip handle. The gun shall be of constant flow type and shall have discharge capacity of not less than 150 LPM. The gun shall have facility to set of either spray or jet pattern reparably in handle grip. The gun shall have ability to work on pressure from 50 kg/cm² to 100 kg/cm² without affecting the discharge pattern. The weight of the gun assembly shall not be more than 3.0 kgs.

13 PUMP TEST :

Both the pumps fitted on the vehicle shall be subjected to various test as detailed below.

- 13.1 The pump with its all fitments will be subjected to Hydrostatic testing on a pressure of 21 kgs. /cm²
- 13.2 The centrifugal pump shall be run dry for a period of minimum one minutes at 2000 RPM to check the integrity of mechanical carbon seal. After this test there shall not be any leakage of water through carbon seal.
- 13.3 The centrifugal pump will be subjected to Endurance test for a period of FOUR hours continuous running. The first Three hours the pump shall deliver rated output of 3000 LPM at 7 kg/cm² and next one hour will be 300 LPM at 35 kg/cm².
- 13.4 The reciprocating pump shall be run dry for a period of minimum one minutes to check the integrity of piston seals. After this test there shall not be any leakage of water through seal.



- 13.5 The reciprocating pump will be subjected to Endurance test for a period of one hours continuous running by simulating the height by controlling the pressure. The pump shall deliver output of 250 LPM constantly at ground level as well as at height of 200 meters.
- 13.6 During the endurance test the water shall not be replenished in the cooling system and the temperature of the cooling water and engine oil should not exceed the manufacturers standards recommendations for the continuous operation and engine should not show any sign of stresses.

14.0 ELECTRICAL SYSTEM & FITTED ACCESSORIES:

- 14.1 All important electrical circuits shall have separate fuses suitably indicated and shall be grouped into a common fuse box located in an accessible position in driver"s cab and fittedwith means for carrying spare fuses.
- 14.2 The wiring shall be single pole and shall not be exposed to the atmosphere. Conduits shall be used, wherever necessary. The wire selected shall be of suitable size for different circuits considering the current consumption of that circuit with min. 20% higher capacity. All the wires shall necessarily be copper conductor with proper insulation.
- 14.3 All equipment lockers will have individual lights and these will be operated by means of a master switch on the dash board in the driver cabin.
- 14.4 A trickle type battery charger having capacity of 250 volts to charge 24 volts battery will beprovided for recharging the battery in situ. A red pilot lamp indicating when the batteries are being charged from an external supply will be provided. This is required to be fitted at appropriate location on the appliance.
- 14.5 Following electrical fittings will be provided on the appliance at suitable locations

Hand Lamps	2
Battery operated siren 1km range	1
Fog Lamps	2
LED Light Bar with Inbuilt PA System with Multi tone Siren & Hooter in on Unit	1
Search Light (min. 1000 Lum.) with 30 meters Cable Reel	1
Spot Light (mounted near driving compartment)	1
Inspection Lamp with bracket	1
LED flasher lights (both side & rear side) Red, Yellow, Blue & white etc.	6



LED WORK LIGHT -operated on DC mounted on top rail each side, @ 500lm Lighting power.	5
LED scrolling or flashing display sign board (scrolling letters willgiven by Fire Dept)	1
Reverse Sound Hooter, with Additional Lights and Reverse Camera with Picture Screen in Cabin	1 Set
Separate special Master ON/OFF Switch for all lights together, shall be give on Dash Board	1
Fire Bell made of Gun metal 250 mm	01
PUBLIC ADDRESS SYSTEM: Battery operated public address system Ahuja or equivalent make having range of the sound of the public address system would be within 500 mtrs & 12 volts power supply shall be drawn from the battery of the chassis should be provided. The PA system should consisting of amplifier, loud speaker and mike shall be fitted inside the drivers cabin in front of the officer"s seat. Amplifier and microphone shall be clamped / fixed type in front of officer"s seat. Horn unit / loud speaker shall be mounted on roof of the cabin.	01 No.

15.0 PAINING AND MARKINGS:

- 15.1 The entire structure will be prepared by grinding the welded surfaces, priming the finished material with a zinc rich primer.
- 15.2 **Surface Preparation:** This would be poly- urethane (PU) based paint.
- 15.3 **Vehicle Exterior Paint:** The complete vehicle (all exterior surfaces) & monitor would be painted with at least 2 coats of zinc phosphate primer each of 50 microns DFT & 2 coats of polyurethane finish paint each coat of 50microns DFT. Further improvement on the paint maybe carried out by the manufacturer beyond that mentioned above, to give better protection & surface finish.
- 15.4 The entire appliance shall be painted with Fire Red paint i.e. RAL 3000 using double coat spray painting on the outside. The user"s (ULB"s) name and logo will be written on both-sides with yellow colour (in English & Marathi).
- 15.5 **Marking / Name Plates:** All the lockers / cabins will be provided with SS name plates with

(Handwritten signature)



letters itched on it boldly indicating the content

15.6 Each appliance shall be clearly and permanently marked with the following information:

- 15.6.1 Manufacturer"s name, or trade-mark, if any;
- 15.6.2 Serial number of the pump body and year of construction;
- 15.6.3 Capacity of pump, in l/min;
- 15.6.4 Capacity of water tank, in litre;
- 15.6.5 Nominal speed, in rev/min;
- 15.6.6 Transmission ratio of the PTO;
- 15.6.7 Working pressure, in kg/cm²;
- 15.6.8 Direction of rotation of the pump shall be indicated by an arrow and this shall be permanently marked on the pump body; and
- 15.6.9 Lubrication points, drainage devices, etc, shall be colour coded.
- 15.6.10 Engine & Chassis no.
- 15.6.11 Instructions for Driver in cabin

15.0 DOCUMENTS :

16.1 Following Documents has to be submitted during the bidding process and after the delivery such as :

- General layout of the tender / equipment layout.
- EN / CE Certificate as per applicability from third party (self-certification not permissible)
- Flow diagram Electrical system Locker drawings

16.2 User Manual and Instruction Booklet- Instruction books for the guidance of the user including both operation and normal maintenance shall be supplied for all the equipment in English language. The books shall include an item wise and illustrated spare parts list giving reference numbers of all the possibly wearing parts. The workshop manual and spare parts catalogue of chassis shall also be supplied with vehicle preferably with soft copy.

17.0 ANCILLARY EQUIPMENT & RESCUE EQUIPMENT:

The ancillary equipment as given in the Annexure-A-I of this specification shall be provided along with the vehicle.

18.0 STAGewise INSPECTION.

18.1 Each stage wise inspection will be carried out by representative from the ULB (Purchaser) or any authorized person by Purchaser. It is hereby suggested that there should be minimum three member panel in the inspection team.



- 18.2 Expenses towards lodging boarding of inspecting team members should be born by the Company. To and fro expenses towards the travelling of the team members from the journey place to the works will be borne by the successful tenderer and the offer shall contain all such expenses.
- 18.3 Advance notice of at least 1 week should be given by the fabricator; however the fabricator must keep the vehicle ready for stage wise inspection before giving such notice to Purchaser i.e DMA.
- 18.4 Following stage wise inspection needs to be carried out.

Ist Stage Inspection (Only for Proto type)	<ul style="list-style-type: none"> a) Chassis inspection b) Body Structure Inspection c) Testing of Loose (unmounted) Water Tank and hydrotesting and sand blasting test d) Inspection of Panel Work. Hydrotesting of Pump. e) Installation of Pump, PTO & Piping Pre-finishing inspection. f) Compliance of non-conformities, if any
IInd Stage Inspection / Final Stage (for Proto type and thereafter work order)	<ul style="list-style-type: none"> a) Stability (Tilt) test as per IS standard b) Gradient Test for entire vehicle c) Articulation Test for vehicle d) Road Test for full laden vehicle for min 30kms. e) Four Hours f) Pump Operation Testing. g) Monitor & Hose Reel performance test. h) Complete functions-operations of all systems installed. i) Checking of all catalogues, Operation manual of appliance <p>Any Other : Test as may be required for Final Acceptance</p>

Gradient Test. The vehicle will be tested on a gradient test ramp which has an angle of 1 Mtrs in every 4 Mtrs of distance travelled. The test will be done as per the Indian Standards.

Stability Tilt Test: The static stability of the appliance shall be checked such that when under fully equipped & laden condition (excluding crew), if the surface on which the appliance stands is tilted to either side, to ensure that no overturning occurs till vehicle attains tilting of 27 - + 1 degree from horizontal.




Endurance (Long Running) Test: The rating of pump would be min. 4 Hrs. The pump will be tested for a continuous period of 4 Hrs nonstop & the water will not be replenished in the radiator during this test. The engine shall not show signs of overheating during this test.

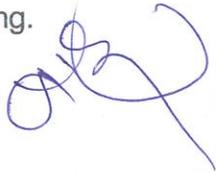
Articulation Test: The vehicles shall be tested for articulation & will not show any signs of stress during this test. Also the clearances in the wheel wells will be checked for tolerances.

Other Test include Turning Radius Test, Road (Braking, Acceleration & Speed).

All these test needs to be cleared from ARAI (Automotive Research Association of India), Govt. of India OR from CIRT (Central Institute of Road Transport) or any govt. accredited third party agencies such as VJTI, SGS, IR Class, and the Test Reports to the effect to be got from the Body Builder / Tenderer.

19.0 TRAINING

- 19.1 The successful tenderer has to arrange training for the personnel of ULB's Fire Service in handling, operation and maintenance of the equipment as mentioned in the Annexures. The training of minimum 1 session of 1 day at ULB's fire station shall be conducted. The training shall cover operation, handling and maintenance of all the tools equipment and gears listed under this tender.
- 19.2 All the expenses towards the training shall be included in the cost in addition to training material and the cost of tools and equipment and consumable required at the time of training.



ANNEXURE A-1

LIST OF EQUIPMENT TO BE Equipment to be stowed / supplied along with the vehicle

Sr. No.	Item	Qty.
1.	Aluminum double extension ladder 10.5 mtr. length trussed type	1 no.
2.	Hook ladder 12 ft. lengths.	1 no.
3.	Delivery hose Type B, ISI 636-mark, size 63 mm X 15 mtr length fitted with ISI 903 Stainless steel male and female couplings and copper wire binding.	4 nos.
4.	PVC suction hoses 140mm X 2.5 mtrs. Length, fitted with round threaded male & female couplings, heavy duty, suitable for above pump conf. to IS: 903.	4 nos.
5.	BA set EN certified make with 45-minute duration, light weight CCOE approved 300 bar and 6 ltr. Capacity carbon composite cylinder & valve.	2 nos.
6.	ABC Fire extinguishers 9 kg	2 nos.
7.	Suction Metal strainer, 140mm size.	1 No.
8.	Basket strainer, 140 mm size.	1 No.
9.	Dividing breaching with control valve made of light alloy/gunmetal	1 No.
10.	Collecting breaching 63 mm size made of light alloy	1 No.
11.	Suction wrenches for 100mm suction couplings Universal type	1 Pair
12.	Long line 50 mm circumferences 30 mtrs Long each	1 Len
13.	Short line, 50 mm circumference, 15 m long	1 Len
14.	Hose bandages, rubberized.	12 Nos.
15.	Hose clamps.	6 Nos.
16.	Hydrant Valve key and bar	1 set
17.	Gunmetal Branch Pipe Universal 63mm size	1 No.
18.	Gunmetal short branch pipe complete with 63 mm size male instantaneous connection with gunmetal detachable nozzle as per IS:903	2 Nos.
19.	Nozzle spanner	2 Nos.
20.	Hand lamp (torch -4 cells)	2 Nos.
21.	Flameproof lamp (usable in the present of inflammable gases of vapors)	2 Nos.
22.	First aid box for 10 persons	1 No.
23.	Rubber gloves	1 Pair
24.	Asbestos gauntlets (in case)	1 No.
25.	Axe, large with fibre handle.	1 No.
26.	Spade light weight.	1 No.
27.	Pick axe with fibre handle.	1 No.
28.	Crow bar	1 No.
29.	Sledge hammer with fibre handle.	1 No.
30.	Carpenter"s saw.	1 No.

(Handwritten signature)

