MARINE DEPARTMENT

Office of the
Chief Fire cum Asst safety officer
/ Pollution control officer.

NO.FS/Foam Tender-Fire/2023 Date: 08.09.2023

NOTICE INVITING BUDGETARY OFFER

Budgetary offers are invited for the supply of the following items at Cochin Port Authority.

Sl.No.	Name of item	Quantity
01	Foam Fire Tender fabricated on chassis of given specification as per IS10460-1983 reaffirmed in the year 2000 (Detailed Specification attached)	01

Budgetary offer may be sent to the Chief fire Cum Asst. Safety Pollution Control Officer, Cochin Port Authority, Willingdon Island, Cochin-682003 by email on or before 15.09.2023
The bidders may note that the offers are invited only for budgetary purpose to prepare an estimate. Cochin Port is not bound to purchase the items from the bidders based on the budgetary offer submitted.

Terms & Conditions :-

1. Delivery Terms – Fire Station at Cochin Port Authority , Willingdon Island.
2. Delivery Period – 06 to 7 months from the date of issuing purchase order

Sd/-
Chief Fire Cum Asst. Safety Pollution Control Officer
Cochin Port Authority
Cfo.copt@cochinport.gov.in
Phone : 04842666555
Mob : 9447460131

PRICE SCHEDULE – BUDGETARY OFFER

Name & Address of the Bidder:

Sl.No.	Description of Item	Quantity (No)	Total Price (Rs.)	GST in figure & in %	Total Price (INR) (4 + 5)
(1)	(2)	(3)	(4)	(5)	(6)
01	Fabrication of Foam Tender on a Chassis of given specification as per IS10460 (latest edition) – Detailed specification attached.	01			

Signature

Note :-

1. The bidder shall quote the price in Indian Rupees only
2. The bidder should also indicate the GST clearly in percentage in Column (5).
3. Please mention delivery period also

TECHNICAL SPECIFICATIONS OF FOAM TENDER

1. **GENERAL:**

1.1. The Foam Tender shall be fabricated on suitable 28T on Cabin Chassis having minimum 230HP engine. The chassis shall be as per the latest prevailing CMVR norms. The bidders should offer a complete package including the cost of the chassis. Chassis shall be mounted with 8000L Water Tank, 2000L Foam Tank, along with 4000 LPM normal pressure pump, PTO and accessories as listed here.

1.2. No part of the chassis shall be cut or mutilated by the successful tenderer without the prior permission of Chassis manufacturer or the customer.

1.3. 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 Chief Fire Officer with satisfactory test.

1.4. 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.

2. **CHASSIS:**

2.1. 28-ton, Cabin chassis, right hand drive, having minimum 230 BHP engine and, minimum 6-cylinder water cooled, with BS VI emission norms. The chassis shall be as per the latest CMVR prevailing norms. It should have manual transmission.

2.2. Engine : The engine shall be six cylinder in line, water cooled, direct injection diesel engine with intercooler, developing min.230 HP.

2.3. Transmission : The vehicle shall have manual synchromesh 6 speed

2.4. Steering : Hydraulic assisted Power Steering

2.5. Brakes : Air braking system with auto slack adjuster, and ABS, graduated valve-controlled spring brake chamber integral with rear brake for parking brake.

2.6. Suspension : Parabolic spring for Front and semi-elliptical Multi leaf spring at Rear

2.7. Frame : The chassis frame shall be Heavy duty Ladder type Frame to support the gross weight of the body and all other equipment under specified operating conditions.

2.8. Wheels and Tyres : Radial Tube Tyres(including spare tyre)
2.9. Fuel Tank : Min. 365 litres capacity.
2.10. Electrical System : 12/24 volts. With suitable Ah capacity battery with Alternator. Battery main switch for cutting all power from the battery, switch shall be located at suitable location.
2.11. Cabin : OEM fitted Day Type Cabin
2.12. GVW : Not more than 28000 Kgs.
2.13. Tool kit : Standard tool kit with jack.

3. **WATER TANK:**

3.1. The water tank should have capacity of max. 8,000 Ltrs with internal baffle plates to avoid water surging while accelerating braking or cornering.

3.2. The water tank should be fabricated from 5mm thick SS-304 sheets. The tank shall be mounted with suitable plates on the chassis immediately behind the cab to allow full contents to flow to the pump.

3.3. The tank should have sufficient baffles of 4mm thick to prevent surge while the vehicle is accelerating, cornering & braking. The design of the baffles shall provide access to all compartments for repairs & maintenance. The baffles shall be easily removable & only SS-304 nut-bolts, should be used.

3.4. The water tank and the superstructure shall be mounted on a sub-frame equipped with anti-vibration meta cones. The mounting should be such a way that full rated contents of the tank flows into the pump.

3.5. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repairs/replacement as and when necessary.

3.6. There shall be two filling orifices not less than 25cm diameter and shall be fitted with a removable strainer and filter and filter cap clearly marked “WATER”.

3.7. Two manhole of 450mm shall be provided on top of the tank with suitable locking system.

3.8. A drain cock and a pipe of not less than 50 mm shall be provided at the bottom of the tank for complete draining out for cleaning purpose.

3.9. An overflow pipe of not less than 70 mm diameter. The discharge end of the overflow pipe shall be taken down to a point well below the chassis without reducing the ground clearance. The pipe shall be designed, or other means provided to ensure that water will overflow this way only while refilling the tank but no water shall overflow through this pipe when the appliance is in motion, is standing on uneven ground, and/or brakes are applied to the moving appliance.

3.10. Two 63 mm instantaneous hydrant connections incorporating a strainer shall be provided as close to the pump panel control as possible for filling the tank.

3.11. A suitable bore pipeline shall be taken from the tank to the suction inlet of the pump incorporating a 150 mm quick action butterfly type valve.

3.12. Separate valves for performing all the function shall be provided to control the flow of water to the hose reel equipment.

3.13. Drain plugs for drain cocks shall be provide, wherever necessary. A suitable size filter should be provided between the tank and pump to prevent solid debris entering the pump.

3.14. A quick cleaning mechanism should be provided for cleaning the filter in the event of blockage during pump operation.

3.15. The tank connected with the pump, hose reel and valve(s) shall be provided in such a way that any of the following operations are possible.

3.15.1. Hydrant - tank,

3.15.2. Hydrant - reel,

3.15.3. Tank – pump – hose reels,

3.15.4. Hydrant – pump – hose reel, and

3.15.5. Tank - Pump - Monitor

3.15.6. Off. (Recirculation of water to tank when all outlets are in closed position)

3.16. The complete top of the tank & rear portion of the vehicle including foot board should be covered completely with aluminium chequered plate of minimum 2.5mm with beading all around.

3.17. The tank shall be tested by compressed air 5 PSI with 90% full of soapy water. The duration of the test shall be 30 Minutes. All welded seams shall be checked for leakage on the outsides.

4. **FOAM COMPOUND TANK:**

4.1. The foam tank of **2000** Liters capacity will be fabricated out of min. 4 mm thick **SS-316L** plates for bottom & the sides & baffles.

4.2. In addition, a 2% of expansion space will be made in the tank, over and above foam compound capacity.

4.3. The tank will be suitably baffled.

4.4. Inspection hole of 450 mm with cover will be provided.

4.5. The cleaning hole of 100 mm & drain pipe with a ball valve & plug incorporated in it will be provided.

4.6. The filler orifice of 150mm dia. with a removable strainer (Material- Resistant

to the attack of foam compound) will be provided. The filler cap will be clearly marked "FOAM".

4.7. The design of the tank shall incorporate a removable sump fitted with a drain valve.

4.8. The foam compound draw-off tube shall be positioned in the centre of the sump in such a manner that foreign matter or sludge will not pass into the compound line.

4.9. The draw off tube will be connected to the foam proportioner with NRV in addition to the main control valve.

4.10. The draw off pipe will be fitted with removable strainer.

4.11. Provision will be made for drawing foam compound direct from an external source through a pick up tube while producing foam.

5. FOAM PROPORTIONER:

5.1. Manually operated selector type around the pump foam proportioning system shall be provided at the rear of the pump.

5.2. The Pump proportioner shall induct foam & water proportionately to feed the foam monitor and hand lines at rate of 6 % plus/minus 0.5% foam.

5.3. The proportioner shall be calibrated to ensure the correct intake of air foam liquid to foam equipment having five different position selector valve i.e., 0, 1, 2, 3 & 4.

6. **PUMP:**

6.1. The pump shall be EN / NFPA certified, normal pressure centrifugal type, of reputed make such as Godiva / Firefly / Magirus make confirming to EN 1028 standards or UL classified in accordance with NFPA 1904.

6.2. The pump shall comply following performance parameters:

6.2.1. Normal Pressure output	:	4000 LPM at 10 kgs/cm2
6.2.2. Deep lifting capacity of pump min. 7 mtrs	:	Not more than 30 sec at NTP conditions

6.3. Normal pressure type centrifugal fire pump shall be made of Gun Metal construction and shall be mounted at the rear of the vehicle driven by vehicle engine through a power take off of suitable ratio to ensure maximum rated hydraulic efficiency of the pump.

6.4. The pump shall be compact in design and have one inlet from tank to pump suction of not less than 140 mm.

6.5. There shall be Four 63mm deliveries with hose pressure relief arrangement shall be fitted with instantaneous delivery coupling as per IS 901, on the built-in

discharge manifold having provision for monitor piping.

6.6. The centrifugal impeller shall be made up of Stainless steel and shall be dynamically balanced, mounted on a stainless-steel shaft.

6.7. The pump shaft shall be held in heavy duty ball/roller bearings running in oil bath. The pump shall have a self-adjusting mechanical carbon seal.

6.8. The pump shall be fitted with inbuilt water ring type priming system capable of priming the pump from 7 meters in not more than 30 seconds, when tested with the 140 mm suction hose at NTP conditions and considering the allowances as stated in IS: 950-2012.

6.9. There shall also be an additional exhaust ejector primer along with water ring primer.

6.10. The pump shall also be tested for the following tests:

6.10.1. Static hydraulic test of assembly at 21 bar for 10 min.

6.10.2. Dry vacuum test shall attain 620 mm of hg within 20 seconds while tested.

6.10.3. Deep lift test 7.0mtr within 36 seconds at NTP condition with 140 mm suction Hose.

6.10.4. The pump shall be kept running for a period of three hours non-stop delivering the guaranteed duty point(low pressure) output with a suction lift of 3.0

6.10.5. All relevant material test certificates like material test certificate, impeller balancing certificate etc. shall be issued.

6.11. Details of pump such as its make and model with full technical features, supported with catalogues, brochures, drawing etc. and pump performance curve at low and high pressure shall be attached with the bid.

6.12. Details of pump such as its make and model with full technical features, supported with catalogues, brochures, drawing etc. and pump performance curve at low and high pressure shall be attached with the bid.

7. **PTO Unit:**

7.1. FIREHAWK/VAS/OMSI/WEBSTER/KOZMAKSON make power take-off unit shall be able to transfer full torque of the engine to the axle.

7.2. The PTO shall have a suitable input to output ratio so as to keep the engine rpm within the maximum torque range specified by the chassis/engine manufacturer while the pump is operated at its duty point.

7.3. The main casing shall be made preferably in light aluminium alloy and shall be heat treated for additional strength, the bearing holders however shall be made in cast iron, and the gears shall be helical and shall be ground for

noiseless operation.

7.4. The gear shifting shall be of single lever type only and multiple linking to engage/disengage the pump side shall not be allowed. There shall be inbuilt self-locking arrangement to keep the unit firmly in the gear selected.

7.5. The PTO shall have inbuilt water-cooling arrangement to enable the usage of PTO in harsh environments on continuous basis.

7.6. The maximum operating temperature of the oil shall not exceed 85-90^{o} C (at NTP conditions) when the PTO is tested for endurance test with cooling arrangement.

7.7. The PTO unit shall have provision to judge the oil level reasonably and shall be fitted with a magnetic drain plug along with breather and oil filler cap.

7.8. Oil seals used shall be of highest quality and rotary seals/ water slingers shall be used over & above the oil seals to prevent dust/water entering into the oil seals.

7.9. The gear shifting shall be achieved pneumatically with the aid of vehicle's air tank and an illuminated indication shall be given near the driver to indicate the completion of PTO engagement.

7.10. The design of the PTO shall be such that all the gears/oil seals/bearings etc. on the drive and driven side can be removed from the casing in situ (without taking the PTO down from the vehicle), to reduce the down time of the vehicle under PTO maintenance.

8. **MONITOR:**

8.1. TFT/AKRON/ELKHART make monitor shall be provided on the roof of the vehicle capable for delivering up to 1000 GPM,

8.2. Monitor shall be made of material Pyrolite with polyester coating, thermic treatment, high strength protected against corrosion and anodized to resist to chemical attack of foam concentrates.

8.3. It should have T-handle for vertical and horizontal movement, horizontal movement adjustment lock able by knob and vertical movement adjustment lock able by knob.

8.4. It should be capable for +90 degree to -45 degree vertical movement and capable 360 degree horizontal movement. Inlet should be 3'inch (80 mm Flanged).

8.5. Monitor dimensions shall be as minimum as possible and weighing less than 7 kgs.

8.6. The monitor shall have built in pressure gauge.

8.7. The monitor shall have cast in turning vanes & integrated removable stream

shaper for maximum reach and stream performance.

8.8. The diffuser for monitor should have wide, dense, fully adjustable fog pattern.

8.9. Max operating pressure 14 bar.

8.10. It should be constructed of lightweight Pyrolite Material & shall have spinning teeth.

8.11. The diffuser or nozzle shall have wide, dense, fully adjustable fog pattern constructed of lightweight Pyrolite Material & shall have spinning teeth.

8.12. It shall have Manual Pattern fixed gallon age setting of 500 GPM at 7 Bar.

8.13. Diffuser shall have 2.5" inlet matching to monitor outlet & weight shall not exceed 2.5 kg.

8.14. It shall have reach of not less than 60-65 meters at 7 bars is provided at nozzle inlet.

8.15. Monitor shall meet EN-15767-1 with warranty of five years.

9. **CONTROL PANEL:**

9.1. The control panel shall be provided on the rear portion of the appliance near the pump, designed keeping in mind the ease of operation and maintenance.

9.2. Control panel shall be ergonomically designed to ensure that all controls come to hand easily and intuitively and shall ensure that scheduled operations and preventive maintenance is easily possible.

9.3. Pump control panel shall include pressure governor and monitoring display kit, including a control module, intake pressure sensor, discharge pressure sensor, and cables.

9.4. The control module case shall be waterproof and have dimensions not to exceed 175mm x 120mm and the control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the centre. It shall not extend more than 50mm from the front of the control module.

9.5. Inputs for monitored engine information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring. Inputs from the pump discharge and intake pressure sensors shall be electrical.

9.6. The following continuous displays shall be provided on the control panel:

9.6.1. Engine RPM; shown with four daylight bright LED digits more than 1/2" high.

9.6.2. Check engine and stop engine warning LED's.
9.6.3. Engine oil pressure; shown on a dual colour (green/red) LED bar graph display.
9.6.4. Engine coolant temperature; shown on a dual colour (green/red) LED bar graph display.
9.6.5. Transmission Temperature: shown on a dual colour (green/red) LED bar graph display.
9.6.6. Battery voltage; shown on a dual colour (green/red) LED bar graph display.
9.6.7. Pressure and RPM operating mode LEDs.
9.6.8. Pressure / RPM setting; shown on a dot matrix message display.
9.6.9. Throttle ready LED.

9.7. A dot-matrix message display shall show diagnostic and warning messages as they occur, showing monitored apparatus information, stored data, and program options when selected by the operator.

9.8. All LED intensity shall be automatically adjusted for day and night-time operation.

9.9. The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button and shall monitor inputs and support audible and visual warning alarms for the following conditions:
9.9.1. High Battery Voltage
9.9.2. Low Battery Voltage (Engine Off)
9.9.3. Low Battery Voltage (Engine Running)
9.9.4. High Transmission Temperature
9.9.5. Low Engine Oil Pressure
9.9.6. High Engine Coolant Temperature
9.9.7. Out of Water (visual alarm only)
9.9.8. No Engine Response (visual alarm only).

9.10. The program features shall be accessed via push buttons located on the front of the control module.

9.11. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

9.12. The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes.

9.13. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the

governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 2 bar.

9.14. A throttle ready LED shall light when the interlock signal is recognized.

9.15. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

9.16. The pressure governor and monitoring pressure display shall be programmed at installation for a specific engine.

9.17. The details of the Electronic Control Panel such as its make and model, supported with authorization and catalogues / brochures / drawings etc. should be attached with the offer.

9.18. In addition to the Pressure governor, following Analog control and gauges shall also be provided:

9.18.1. Pressure gauge 3" dia. : Low pressure - 0 to 17 kg/cm2

9.18.2. (Glycerin filled) : High pressure - 0 to 50 kg/cm2

9.18.3. Compound gauge 3" dia. : Vacuum - 0 to 680 mm of hg in Red.

: Pressure - 0 to 10 kgs/cm2 in Black.

9.18.4. High pressure hose reel circuit control.

9.18.5. Cooling water circuit control.

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

9.18.7. Water level indicator calibrated on full, ¾, ½, ¼ and empty.

9.18.8. Auxiliary throttle control for engine.

9.18.9. Vacuum (compound) gauge

9.18.10. Pump prime button

9.19. Pump compartment shall be illuminated adequately. The entire area shall be covered by roller shutters.

10. **COOLING SYSTEM:**

10.1. An indirect cooling system of close circuit type heat exchanger shall be provided for cooling the radiator water & Engine and back to the pump inlet.

10.2. The pipe line of coolant tank shall be of copper for effective cooling.

11. **CREW CABIN**:

11.1. The driver cum crew cabin shall be made in line and in continuation and

shall be such as to accommodate driver and officer in the front and 4/5 firemen at the rear.

11.2. The under frame cross members shall be fabricated and made out of rolled M.S. channel of 100 x 50 x 5 mm, secured to the runner running full length of the chassis frame with suitable mounting plates. The runner shall be fixed to the chassis frame with suitable arrangement.

11.3. The complete superstructure of the cabin shall be constructed out of SS-304 square tube of 30X30X2 mm. The superstructure shall be strengthened specifically on the members where the doors and window frames are to be fitted and also on the other members by providing brackets and the gusset plates securely fitted.

11.4. The flooring of the driver cum crew cabin shall be fabricated out of SS-304 angles of 40 x 40 x 4mm thick which shall be properly welded/ bolted to the cross members.

11.5. The driver-cum-crew cabin shall be equipped with full four doors, one for driver, one for officer in the front and two at the rear for the crew members.

11.6. All the doors shall be fitted on the super structural members each hung upon the two/three numbers coach type stout hinges and fitted with best quality N.P. handles. In addition to the automatic door lock, aluminum tower bolt of 8 inch shall be provided for the doors from inside.

11.7. The window on all the doors shall be full lift type.

11.8. A peep window of suitable size shall be provided at the officer's side bottom panel above the floor level for the use of driver to see clearly the off side.

11.9. For all the above windows, 5 mm. thick toughened safety glasses in an aluminum extruded frame shall be provided.

11.10. The front-end structure, cowl shall be original and shall be retained as supplied with the chassis. The wind screen glasses shall be semi curved type single piece.

11.11. The wind screen glass frames shall be made from SS 304 sheet of min. 18 SWG.

11.12. The rubber bedding used for fitting glasses and window frames shall be E.P.D.M. rubber.

11.13. The complete external paneling of driver-cum-crew cabin, including doors shall be of 16 SWG aluminum sheet and the roof shall be of 2 mm. thick aluminum sheet. The domes and corners shall be as small as possible and shall be of 18 S.W.G. aluminum sheets for roof. All the sheets of the outer panelling will be glued to the framework. Riveting / bolting / screws shall not

be permitted.

11.14. The complete internal paneling of driver-cum-crew cabin shall be of 16 SWG aluminum sheet properly riveted and bided to the super structural members.

11.15. The flooring of the driver-cum-crew cabin shall be fabricated from 2.5 mm aluminum chequered plates except over the mudguard arches which shall be of 2 mm aluminium chequered plate rigidly fixed to the under frame by means of nuts and bolts or riveting. Trap doors for topping up wherever necessary shall be provided.

11.16. All the super structural members and under frame cross members shall be painted with three coats of anti-corrosive paint. All the under frame cross members shall be painted with two coats of chassis black paint.

11.17. Non-slip type steps and rails shall be provided in the cabin to assist the crewmembers to get in and out. The grab handles shall be provided from inside the cabin preferably on door pillars.

11.18. The driver seat shall be fully adjustable type both vertical upward and downward, forward and backward, fixed to the flooring by means of nuts and bolts. The seat assembly shall be of original design approved by chassis manufacturer.

11.19. The officer's seat shall be fixed type rigidly fixed to the flooring by means of nuts and bolts and shall have integrated BA set mounting arrangement.

11.20. The seat cushion shall be of high-density latex foam rubber upholstered in good quality fabric/foam leather cloth of approved shade. The backrest shall be of high-density latex foam rubber upholstered in good quality fabric /foam leather cloth of approved shade.

11.21. The crew seat shall be suitable for 4/5 firemen, rigidly fixed to the floor by means of nuts and bolts, running full width of the vehicles. The fireman's seat shall be provided with high density latex foam rubber upholstered in good quality fabric /foam leather of approved shades. The screw seat shall have facility to integrate ready to use BA sets.

11.22. Below the crew seat, two lockers shall be provided, one for Trickle type battery charger and another for keeping accessories. A First-Aid box shall also be provided in the cabin at easily accessible location.

11.23. Cabin shall have one roof light and two sidelights. Two numbers of large sun visors and rear-view mirrors shall be provided on each side.

11.24. The driver will be provided with large size rear view mirrors on both sides of the cab & convex round mirrors for overall rear view of the vehicle from top to bottom & left to right.

11.25. **Note: The above specifications are not applicable for Factory built, fully**

trimmed driver or crew cabin provided by the chassis manufacturer suitable for fire fighting vehicles. In case of OEM supplied driver cabin, separate crew cabin shall be built just behind the driver's cabin as per respective specification to accommodate 4/5 firemen with 2 doors, windows and peep windows, paneling, seats, etc. as mentioned above.

12.REAR BODY

12.1. The rear body shall accommodate sufficient number of lockers to keep suction hoses delivery hoses, and other accessories and water tank, Pump, P.T.O. ladder, etc.

12.2. The rear body shall be fabricated in continuation and in line. The under frame cross members shall be fabricated from M.S. rolled channel section of 100 x 50 x 5 mm.

12.3. A full-length runner fabricated from MS rolled channel section of 100 x 50 x 5mm thick shall be provided and fixed on the chassis frame by means of 6mm thick MS plate bolted to the chassis frame as per the available bolt holes. A 5/8" dia 'U' clamp shall be provided where the fixing plate cannot be provided due to non-availability of bolt holes on chassis frame.

12.4. The complete superstructure of the rear body shall be constructed out of SS-304 square tube of 30X30X1.6 mm manufactured by reputed company. The superstructure shall be strengthened specifically on the members where the doors and window frames are to be fitted and also on the other members by providing brackets and the gusset plates securely fitted. The details of super structure members shall be mentioned clearly in the drawing and shall be submitted along with the offer.

12.5. The flooring of the lockers shall be fabricated from SS-304 angles of 40 x 40 x 4mm thick.

12.6. All the under frame cross members and other Mild Steel members shall be painted with two coats of rust preventive paint. All the under frame cross members shall be painted with two coats of chassis black paint.

12.7. The side paneling of lockers shall be made of 16 SWG aluminium chequered sheet and the flooring shall be made from 2.5 mm chequered aluminium sheet.

12.8. The complete top deck of the rear body shall be provided with 3 mm aluminium chequered sheet rigidly fixed to the super structure members.

12.9. The complete vehicle shall be panelled externally with 2mm Aluminium sheets and internally with 16 SWG aluminium sheet.

12.10. Access to the Diesel tank should be through an opening near diesel tank for filling by a cut out inside panelling and also to facilitate dip

measurement of the Diesel in the tank.

13.LOCKERS:

13.1. Sufficient number of lockers shall be provided at both the sides of rear body for keeping all the equipment and tools mentioned in the specification.

13.2. The lockers shall be divided into compartments and halves and arranged in such a manner that the load distribution shall be equal on both sides. The final design will be decided at the time of fabrication work.

13.3. The size and placement of lockers shall be clearly shown in the drawing. There shall be lockers provided at the skirt level of suitable size on both the sides.

13.4. Alllockers' floorsshallbelaidwith2.5mmAluminiumchequeredplate.

13.5. All lockers shall be provided with internal automatic on-off lighting system with a master switch in cab. All lockers shall also be suitably labelled so that each item will have identification when it is required to be accessed.

13.6. All lockers below the chassis level shall have flap door opening downward, while all the lockers above chassis level including the pump room shall have roller shutters.

13.7. Roller shutter assembly including drip channel, sill plate, LED lights and its sensors shall be of MCD/ROM/KOZMAKSON only.

14.MISCELLANEOUS

14.1. The original rear bumper as provided by the chassis manufacturer shall be retained.

14.2. All light fittings at the rear shall be suitably protected by expanded metal to prevent damage due to movement of crew.

14.3. Two cat ladders made out of SS pipe of at least 1" dia shall be fixed at the rear.

14.4. The rails on the roof top and the rear shall be of SS 304 pipe of 30mm diameter with suitable mount of bracket and approx. 300mm from the roof top.

14.5. The appliance shall be fitted with a towing arrangement at the rear of adequate strength to carry one ton trailer.

14.6. The overall height shall not exceed the permissible limits.

15. **PIPELINES:**

15.1. All piping and plumbing shall be designed to have minimum pressure drop & achieve the required pressure & flow at various locations.

15.2. All pipe fitting & valves shall be of SS-316, material.

15.3. All piping shall be designed for 10% over the maximum pressures encountered in the piping.

15.4. The piping shall be flanged as far as possible for ease of maintenance.

15.5. All lines shall be hydraulically tested at 1.5 times the design pressure however in no case the lines shall be hydraulically tested below 18 bar.

15.6. All bolting will be SS 304. All valves shall be of AUDCO/ L&T make only.

15.7. 1No.of male coupling with ball / butterfly valve shall be provided at the rear each side for filling the tank and the filling pipe shall be100mm and connected to the tank from the top.

15.8. The overflow pipe should be provided on top centre of the tank. From the water tank to pump, the main pipe should be of 150 mm dia with suitable valve as required and the horizontal part of the pipe shall have Bellows type rubber joint.

15.9. Proper road clearance of 20"should be provided while connecting the pipe.

16. **TELESCOPIC LADDER:**

16.1. It shall have extended length of 4m intended for rescuing and carry up to 3 people with a maximum load of 500 kg. it shall confirm to EN1147 & NFPA.

16.2. It shall be fabricated from triangular aluminium section, weighing less than 20 kgs.

16.3. Ladder tread shall be approx. at 75 degrees, so that when the ladder is inclined against the wall, tread shall remain almost horizontal, for the fireman to work efficiently.

16.4. Authorisation letter, Brochure and Certificate shall be submitted along with the bid.

17. **LADDER GALLOWS**

17.1. The gallows shall be provided to carry aluminum Double extension ladder of 10.5 mtrs height, as per IS4571.

17.2. The design of the gallows shall be such that the ladder can be released without difficulty from a reasonably accessible position.

17.3. Means shall be provided for locking the ladder when stowed.

18. **ELECTRICALSYSTEM & ACCESSORIES:**

18.1. All-important electrical circuits shall have separate fuses suitably

indicated & shall be grouped into a common fuse box located in an accessible position in Driver's cab and fitted with means for carrying four spare fuses.

18.2. The wiring should be single pole and should not be exposed to the atmosphere. Conduits shall be used wherever necessary.

18.3. All equipment lockers should have individual lights, and these should be operated by means of a master switch on the dashboard in the driver's cabin.

18.4. A trickle type battery-charger shall be provided for recharging the battery.

18.5. In addition to the normal lights, the vehicle shall be fitted with the following electrical lights & accessories:

18.5.1. Four Side Lights (Two on each side)

18.5.2. Reversing lights on either side should be fixed suitably at the rear of the appliance with wire mesh in such a manner to prevent accidental damage by the fireman while mounting the tank top.

18.5.3. Reverse Alarm

18.5.4. GRAND / SOLPHIN / REX / ECTROS make LED Light bar shall be mounted on top of the driver cabin collectively consisting of Red, White & Blue colour.

18.5.5. Public Address System with 2 tone hooter shall be provided above the drivers cabin, and speakers (microphone) inside the driver's cabin.

18.5.6. Two ISI marked fog lamps should be suitably attached to the front bumper of appliance.

18.5.7. A spotlight of 50W power shall be provided at the rear portion of appliance near the pump.

18.5.8. 2nos. Dual Red-White, 2nos. Dual Blue-White and 2nos. Dual Red-Blue Scene-Lighting LED blinkers with inbuilt flasher having Aluminium Polycarbonate Base shall be installed on both sides of the body. The lights shall be rated IP66 or higher and shall have Vibration and Optical Test Certification from NABL Accredited Lab. Certificate of the same shall be submitted with the technical bid.

18.5.9. A powerful search light suitable halogen type & adjustable to give flood or beam light, capable of being readily disconnected & also mounted on a tripod awayfrom the appliance should be provided with tripod & not less than 100 ft of best quality TRS cable with reel. Suitable brackets should be provided on top of tank for the spare wheel.

19.**WORKMANSHIP AND MATERIAL**:

19.1. Workmanship executed shall be of the highest order.

19.2. All rivets and bolt holes shall have a coat of approved paint on both surfaces before riveting or bolting or welding.

19.3. All steel screws, bolts, nuts, rivets etc. shall be zinc coated or shall have rust proof coats by are cognized process.

19.4. The roof joints shall be subjected to rigid water test at vendor's workshop in presence of purchaser's representatives.

19.5. All directions & instructions on all points related to the fabrication shall be executed whenever given by the purchaser's representative for quality and workmanship.

19.6. All the material used in the fabrication of the body work shall be of good quality or approved make & type.

19.7. All equipment & material shall comply with the requirements of the latest relevant IS specifications.

20.**PAINTING AND MARKING**:

20.1. The basic structure material should be zinc plated and thereafter it should be prepared by grinding the welded surfaces, priming the finished material with a zinc rich primer and then finally coated with a two coat of epoxy-based paint.

20.2. The crew cabin and the inside lockers shall be painted in pale cream.

20.3. The chassis and wheel articles shall be painted Black.

20.4. The entire appliance shall be painted in DUPONT make "FIRE RED" paint & thickness of 0.12 to 0.2mm thickness, using double coat spray painting on the outside. Lettering work in yellow color on both sides of the Tender as given below: The paint shall confirm to IS: 2932-1974.

20.5. Owner's emblem in original colour together with name shall be written in golden yellow colour on both sides of the vehicle. The matter shall be conveyed at the time of fabrication.

21. ACCEPTANCE TEST

21.1. Acceptance test shall be carried out as per IS standards in practice. The following acceptance test will be carried out Prior to dispatch of fire tender from the vendor's site / workshop the following tests shall be carried out as acceptance test.

21.2. ROAD TEST

21.2.1. Acceleration & Performance Test

21.2.2. Braking Test

21.2.3. Turning Circle Test

21.3. STABILITY TEST

21.3.1. Under fully laden vehicle (including crew) to the designed payload conditions.

21.3.2. Vehicle shall pass Overturning Test.

21.3.3. The stability of the appliance shall be such that when under fully equipped and loaded conditions, excluding the crew, if the surface on which the appliance stands is tilted to either side, the point at which overturning occurs is not passed at an angle of 25° from the horizontal.

21.4. ARTICULATION TEST

21.5. SHOWER TEST

21.6. PIPE LEAKAGE TEST

21.6.1. All the piping will be subjected to optimum hydraulic test pressure for a period of minimum 30 minutes.

22. **DATA, INFORMATION & DRAWING**:

22.1. Full detailed information of the body shall be submitted for approval before fabrication.

22.2. Instruction book for the guidelines of the user, including both operating and normal maintenance procedures shall be supplied during the time of commissioning.

22.3. The detailed drawing of the body, showing the details of construction, water tank drawing showing baffle arrangement, mounting arrangement of all fitments on the appliance, shall also be submitted at the time of commissioning.

23. GUARANTEE

23.1. 12 months warranty from the date of supply of the tender shall be provided against any manufacturing defects.

23.2. Equipment shall be serviced free of cost at regular intervals by the party during guarantee period of 12 months.

23.3. The appliance shall be confirming to IS:10460 (Reaffirmed in the year -2000)

24. ACCESSORIES

24.1. Accessories as mentioned here shall be supplied along with the vehicle.

S.No.	DESCRIPTION	Qty
1	Aluminium Extension ladder 10.5m trussed type conf. toIS:4571	1
2	Armoured suction hose complete with round thread couplings to suit the pump inlet – 2.5 m long as per IS:902	4
3	Delivery Hose, 63 mm, rubber lined in 30m lengths as per IS 636 complete with instantaneous couplings as per IS 903.	10
4	Suction Strainer for item 2	1
5	Basket Strainer suitable for item 2 as per IS; 3582	1
6	Dividing breaching made of light alloy as per IS: 5131	2
7	Collecting breaching made of light alloy as IS:905	2
8	Suction wrenches as per IS:4643	1 pair
9	Long line,50mm circumference,30m long	2
10	Short line,50 mm circumference, 15m long	2
11	Hose Bandages Rubberized	12
12	Hose Clamps	6
13	Single Layer Proximity Suits	6 sets
14	Fog nozzle with extension applicator with fog head	1
15	Hand controlled branch for 63 mm size hose coupling	1
16	Branch Pipe universal	1
17	Branch with revolving head	1
18	Branch pipe as per IS:903	1
19	Nozzle of size 12 mm, 16mm, 20mm, 32mm	2 Each
20	(a) Adapter for 100 mm suction female thread and 63 mm male instantaneous (b) Adaptor double female instantaneous patter 63 mm (c) Adaptor double male instantaneous pattern 63 mm	2 each
21	Nozzle spanners as per IS:903	2
22	Portable Electric Box lamp with rechargeable accumulator	1
23	Hand Lamp (4 cells)	2
24	Flameproof high-power torch with charger (usable in the	2

	presence of inflammable gases)	
25	Self-contained breathing Apparatus set with ultra-light weight cylinder 300 Bar 6 litres, 45 min duration (EN certified) with one spare cylinder	2
26	First aid box for 10 persons	1
27	Rubber gloves	1 pair
28	Asbestos gauntlets	1 pair
29	Axe, large as per IS:703	1
30	Spade	1
31	Pickaxe	1
32	Crowbar	1
33	Sledge Hammer, 6.5 kgs	1
34	Carpenter's saw, 60 cm	1
35	Hydraulic Jack 30 ton	1
36	Fire Hook	1
37	Tool Kit	1
38	**Portable Pump:** Portable pump having discharge capacity of 800 LPM @ 5 bar shall be supplied complying any according to EN 14466. Pump shall be driven by Briggs & Stratton 4 stroke Petrol engine of 18 BHP. the fuel tank capacity shall be enough to run the pump continuously for 1.5 hours. It shall have electric and recoil type starter for instant start. It shall have a vane type priming system and shall have deep lifting capacity of suction height of 7.5m in less than 25 second. It shall have 2 delivery outlets of 63mm with screw down type valve. The pump shall have a stainless-steel tubular carrying fame with foldable handles. It shall also have flood lights for night operations. It shall be compact in dimension and shall weight less than 90 kgs. it shall be stowed in one of the locker at a suitable place to be used in an emergency situation.	1 no.
39	The Nozzle should be adjustable gallonage with multiple flow settings & 63 mm BIM inlet hand nozzle. The nozzle should have	2

	selectable flow setting of 150-270-350-475-600 LPM with five different setting flow rates@ 7 bar with flush mode without shut off the nozzle made of Pyrolite/Al material, with pistol grip and with Celcon ball valve. The nozzle shall have feature for straight stream & spray pattern. It should be NFPA 1964 compliant and EN-15182 approved. The documents should be submitted along with bid. Standard instantaneous male inlet should be 2 ½" (63mm). Simple to operate pattern control (1/4 turn from straight stream to fog), Raised lug marks straight stream for limited visibility operations and shall have minimum fog angle of 120° and capable of flushing without shutting down or changing stream patterns. Preferable makes POK or Rex or Akron.	
40	Battery Operated Combi-tool(Annexure – 1)	1

41	Foam Branch (FB 10 X) as per IS Standard	04
42	Foam Branch (FB 10) without Pick up tube as per IS Standard	04
43	Fire Buckets	10
44	Fire Beaters	05

			ANNEXURE – 1
1			**BATTERY OPERATED COMBI TOOL**

	1.1		The Combi-tool shall have maximum operating pressure of 700 bars.
	1.2		The Combi-tool shall not need to be connected to an external hydraulic source; generation of the required hydraulic pressure takes place within the body of the device by a quick exchangeable lithium/ion battery.
	1.3		The battery shall be capable to deliver enough power for one hour rescue operation. Battey must be having a rating of not less than 5 Ah, 126 Wh, 25.2 V capacity.
	1.4		The Combi-tool shall equip with lights to facilitate work under poor lighting conditions. For simplicity, the lights must be powered by the same Lithium-Ion battery that powers the Combi-tool and not a secondary battery.
	1.5		The cylinder of the tool shall be made of anti-corrosive light aluminium alloy. The housing shall have ventilation holes on both sides of the unit for cooling the motor. The tool should be fully operational for longer periods at temperature of -20 Degree C up to +55 Degree C.
	1.6		The blades of the tool shall be of a straight serrated edge & made of investment cast dropped-forged steel glass pearl. The blades shall be re-grindable.
	1.7		The control mechanism shall feature a star-grip control actuator for ease of operation by allowing 360-degree operations in any position.
	1.8		The tool must provide a non-interflow shear seal “dead man” actuator; The Combi-tool will be equipped with a dual pilot check valve. This is to prevent accidental movement of the arms in the event of power loss.
	1.9		The tool shall be protected by a pressure relief valve that prevents it from being over pressurized. The star grip automatically returns to the central position, guaranteeing the full load-holding.
	1.10		Combi-tool shall be supplied with following specifications:
		1.10.1	Min. EN classification (13204:2016-12) - 1I/ 2J/3I/4J/5J,
		1.10.2	Min. NFPA classification (1936:2015) – A7/B8/C7/D8/E7,
		1.10.3	Cutting Capacity - not less than 35 mm round steel bars,
		1.10.4	Cutting force - not less than 490 KN.,
		1.10.5	Maximum Cutting Opening - not less than 275mm,

		1.10.6	Min. Spreading Distance measured at the blade tips - 360mm,
		1.10.7	Spreading Force (measured at 25mm from tip end) – 38 KN – 1500 KN,
		1.10.8	Pulling distance - not less than 380mm,
		1.10.9	Pulling force - minimum 60 KN.,
		1.10.10	Operational Weight - not more than 20 kgs.,
		1.10.11	Protection class – IP54.
	1.11		Following accessories to be supplied with combi-tool:
		1.11.1	One rechargeable Li-Ion batteries as per above specification,
		1.11.2	One Battery charger. 230V/50Hz,
		1.11.3	One power supply 230V/50hz for the alternate operation of the tool off a mains connection.
	1.12		The tool must be certified as compliant with latest NFPA 1936, 2020 Edition. The OEM must have NFPA compliant manufacturing facility for Rescue Tools here in India.
	1.13		Factory shall have capability of manufacturing and servicing and testing of Hydraulic Hose line and Battery-operated Rescue tools and shall support spares availability for at least 5 years. Make: Lukas/Hurst only.
	1.14		Manufacturing facility shall be certified by TUV Germany / FM USA / EIL Delhi and relevant document in support to this shall be submitted at the time of bidding.
	1.15		Third party TUV certificate for NFPA 1936:2020 compliance, Make & Model brochure for the offered model shall be submitted along with the Technical Bid.