



കേരള സർക്കാർ  
Government of Kerala  
2017



Regn. No. KERBIL/2012/45073  
dated 5-9-2012 with RNI  
Reg. No. KL/TV(N)/634/2015-17

# കേരള ഗസറ്റ് KERALA GAZETTE

ആധികാരികമായി പ്രസിദ്ധപ്പെടുത്തുന്നത്  
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## PART III Stores Purchase

**Fire and Rescue Services Department**

e-TENDER NOTICE

No. M1-4977/2017.

9th May 2017.

e-Tenders in two cover system are invited from competent manufacturers/fabricators or their authorised dealers with adequate stock and spares and repair capabilities for the purchase of 25 numbers of Water Tenders as per the specifications of this Department. The tender is to be submitted as e-tenders through the web portal <https://etenders.kerala.gov.in>. Since this is an e-tender, only those bidders who have enrolled in the above portal with their own Digital Signature Certificate (DSC) can participate in the tender.

e-Tender document and other details can be obtained from the above e-portal.

The tender has two parts.

1. Technical bid.
2. Financial bid (BOQ).

Tender No. with PAC—KFRS - e-Tender No. 01/2017-18/SN—` 1,000 Lakhs.

EMD—1% of PAC in online payment.

Cost of e-tender (online submission)—` 25,000 + VAT @ 5%.

Date of prebid meeting—19-5-2017, 11 a. m.

Closing date and time of e-tender—9-6-2017, 4 p. m.

Last date and time of receipt of e-tender—9-6-2017, 4 p. m.

Date of presentation and evaluation—14-6-2017, 11.30 a. m.

Date and time of opening of e-tender:

1. Technical bid—13-6-2017, 11 a. m.
2. Financial bid—15-6-2017, 11 a. m.

Date upto which the rates are to remain firm for acceptance—31-3-2018.

Security Deposit—5% of total contract amount as per rules, to be furnished as bank guarantee of a scheduled bank.

Period of supply—Within 120 days of receipt of supply order.

The bidder desiring to take part in the bid shall log into <https://etenders.kerala.gov.in> and then select tender and make the payment. Bidders will be directed to the payment gateway page of the State Bank of India. There are two options-State Bank of India SBI Net banking payment, payment through NEFT from other banks to the payment gateway of SBI.

For obtaining digital signature certificate (DSC) and necessary portal enrollment bidders can visit the website <https://etenders.kerala.gov.in>.

Tenders will be opened online in the presence of such tenderers or their authorized representatives who have logged in before the prescribed time of opening of technical & financial bids. If the date fixed for opening happens to be a holiday/unable to open the tender due to technical issues, the tenders will be opened in the next working day, at the same time.

The tenderer, or his representative, shall be physically present at the Fire and Rescue Services Headquarters on the date prescribed, with necessary documents and presentations on all the technical aspects of the vehicle to be fabricated and accessories for the complete understanding of the evaluation committee and verification. The firms shall give in writing any aspect of fabrication if asked by the evaluation committee during the presentation. The offer of any firm, which fails to represent in the presentation and evaluation in the prescribed date and time, or fails to give complete details of the proposed fabrication including accessories during presentation will be rejected.

The tender fee and EMD shall be received only through online payment SBI/SBI NEFT.

The cost should be quoted in Indian currency only. The tender has two covers.

- Technical cover
- Financial cover

**The first cover i.e., the technical cover shall be uploaded with the following document.**

1. Scanned copy of Departmental Specification Compliance Statement in the given proforma along with diagrams intended to supply.

The Bidder should prepare the specification compliance statement in the following proforma and upload it duly signed. The Specification Compliance Statement should contain all the details in the Departmental technical specifications, and the compliance to the same to be properly marked and deviation, if any, shall be marked in the compliance statement.

**Specification Compliance Statement for Water Tender**

<i>Sl. No.</i>	<i>Details of Departmental Technical Specification</i>	<i>Details of the product offered</i>	<i>Deviation from Departmental Technical Specification, if any</i>

2. Scanned copy of the agreement in the prescribed format in Kerala Stamp Paper worth ` 200.
3. Brochure of the product intended to supply.
4. Work experience certificate O.E.M. Authorisation Letter and other relevant details.
5. Scanned copies of the declaration by the bidder on Kerala Stamp Paper worth ` 200 to the effect that no Vigilance Case has been charge sheeted and pending trial at Court against him/his partner/s or any of his directors in connection with fabrication/supply of similar product made earlier to this department.

I, ..... (Name, Address, firm), do hereby declare that no Vigilance Case have been charge sheeted and pending trial at court against me, any of my partner/s or any of my directors, in connection with fabrication/supply of similar product made earlier to Kerala Fire and Rescue Services Department/Government of Kerala and none of us or our firm is blacklisted by any Government agencies/PSUs in Kerala.

### **Pre bid meeting**

A pre bid meeting will be held at Fire and Rescue Services Headquarters Thiruvananthapuram on the date and time as mentioned above. Bidders can participate in the pre bid meeting and clarify their doubts, if any. They can clarify their doubts by sending an e-mail to [hq.frs@kerala.gov.in](mailto:hq.frs@kerala.gov.in) and by contacting The Divisional Officer, Fire and Rescue Services, Thiruvananthapuram in Phone Number-09497920103.

### **Tender Opening and evaluation**

(a) Soon after the opening of the tender, the tenderers are requested to come to the Fire and Rescue Services Headquarters with documents and presentations on all the technical aspects of the fabrication and accessories for the full understanding of the Head Office Purchase Committee (Technical), on the date specified.

(b) There will not be any further communications about the opening of the technical and financial bids separately. Soon on opening the technical bid of e-tenders the committee constituted to evaluate the technical aspects, will meet and scrutinize the technical specification of equipment submitted with the e-tender.

(c) During evaluation, the tenders will be first evaluated for the compliance of Departmental Technical Specification. Only those tenders which comply the Departmental Technical Specifications will be considered for subsequent financial evaluation.

(d) Those bidders who can comply with all the requirements and conditions of the tender only need to participate in the tender. Any special condition uploaded by the bidder will not be considered for evaluation.

(e) The financial bid belonging to those dealers/suppliers who qualified in the technical bid of the equipment as required above by Kerala Fire & Rescue Services Department alone will be considered.

(f) On finalization of technical evaluation, the second cover i.e. the financial bid of the concerned competent firm will be evaluated by the Head Office Committee (Finance) for consideration.

### **The bidder should upload all the supporting documents along with the Technical cover**

(g) The originals of Technical specification compliance statement of the product, agreement in Kerala Stamp Paper worth ` 200, the declaration on Kerala Stamp Paper worth ` 200 and the Brouchers/Photograph/Diagrams of the fabrication and accessories, O.E.M. Authorisation Letter, if any, and other documents shall be produced before the undersigned soon after the financial Bid opening.

(h) After opening the financial bid, financial evaluation will be done and the details will be uploaded in the financial evaluation field of the e-tender site, only after consultaion with the DPC. The decision of the DPC will be final on the admissibility of the tender and thereafter awarding of the contract.

(i) The right of acceptance or rejection of e-tender or cancelling the tender without assiging any reason, at any stage of tendering, is solemnly vested with the Director General, Kerala Fire and Rescue Services or a committee appointed by him.

The rules and regulations prescribed for e-tenders by the Government of Kerala/Store Purchase Manual, Government of Kerala shall be applicable to this e-tender also. If any tenderer wants any clarification on any aspect of the tender he/she can send email to [dt.frs@kerala.gov.in](mailto:dt.frs@kerala.gov.in) or Fax to 0471-2337422.

Details with respect to the e-tender and the details of specifications of the item to be purchased can be obtained from the e-tender website <https://etenders.kerala.gov.in>.

Any legal dispute that may arise in relation to the e-tender formalities will be restricted to the jurisdiction of Thiruvananthapuram District Court.

**Detailed technical specification for the procurement of water tender with fire fighting Equipments/Accessories**

**I. GENERAL:**

The Water Tender shall be fabricated on the chassis mentioned below. The Water Tender shall be designed to efficiently carry 5000 litres of Water. A centrifugal fire pump with a discharge capacity of 2000 LPM at 7 kg/cm<sup>2</sup> and 300 LPM at 35 Kgs/cm<sup>2</sup> driven through heavy duty Power Take Off (PTO) unit.

**II. CHASSIS:**

The Compact Water/fender shall be fabricated on a suitable brand new Cowl Chassis having the specifications as mentioned below:

Wheel Base	:	Not more than 4500mm
G.V.W	:	Not less than 16000 Kg.
Turning Circle	:	Not more than 20 m
Road Clearance	:	Not less than 230 mm
Overall width	:	Not more than 2.5 m
Power	:	Not less than 150 bhp
Minimum Torque	:	500 Nm @1500-2000rpm
Emission Compliance	:	BS IV
Drive	:	Right Hand Drive
Steering	:	Power Assisted Steering
Braking	:	System with ABS

The bidder have to procure the chassis and fabricate it to make it a Water tender.

The fabricated vehicle should meet all the regulation with respect to motor vehicle Act/Rules in force in the state of Kerala and in no case the weight of the fully fabricated vehicle exceed the rated GVW of the chassis, in fully loaded condition with water, all equipment and crew.

**III. FIRE PUMP (MULTI-PRESSURE TYPE)**

3.1 The fire pump shall be:

- Multi Pressure Type (Combined high - normal pressure).
- CE Marked (as per EN: 1028:2002 and all latest amendments).
- The pump shall be of multi-stage centrifugal type. The pump will be rear mounted for maximum hydraulic efficiency.

**PUMP CONSTRUCTION**

High pressure-low pressure type fire pump shall be 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 hydraulic efficiency of the pump. The pump shall be compact and of modular design having one 100mm suction with round threads as per IS 902 with a removable strainer and two 63mm deliveries as per IS 901 with instantaneous delivery coupling. The discharge manifold shall have inbuilt provision for tank filling piping. The entire high pressure section of the pump shall be made of stainless steel (SS 304/CF8).The pump shall be of front access design such that maintenance of important components like low pressure impeller, high pressure impeller, mechanical seal etc. can be carried out on vehicle without removing the pump and pump's discharge side piping. The low/normal pressure centrifugal impeller shall be made up of gun metal and shall be dynamically balanced. The high pressure impeller of regenerative type shall be made up of stainless steel. Both the low and high pressure impellers shall be mounted on a single stainless steel shaft. The pump shall have a self-adjusting mechanical carbon seal. The pump shall be capable of both high and low pressure operations and operation of high pressure shall be controlled by an easily accessible single, changeover lever. Outlet for high pressure of not less than 25mm dia size shall be there. The pump shall have an inbuilt pressure relief valve to control the high pressure within specified limits and a suitably sized thermal relief valve shall also be provided. The pump shall be able to perform the following duties.

- (a) Low/ Normal pressure-2000 lpm @ 7 bar when tested at a suction lift of 3.0 mtrs at NTP conditions.
- (b) High pressure 300 lpm @ 35 bar.
- (c) Deep-lift test from 7 meter.

The entire pump assembly with all its fittings and priming system shall be hydraulically tested at 52.5 bar for not less than five minutes (All the above tests shall be carried out at pump manufacturer's/ Fabricator's facility). The pump shall be accompanied with following original test reports:

- Hydrostatic test
- Pump material test
- Performance test

Preferable make: Fire-Fly (MFV-MP 1020) or equivalent.

**Warranty for pump: Not less than 5 years**

#### IV. PRIMING SYSTEM

A Heavy-Duty Fully-Automatic Reciprocating Priming System shall be fitted to the fire pump. The priming system shall be fully-automatic in action, require no attention whatsoever from the pump operator other than throttling the engine once the pressure is achieved in the pump. Primer activation and deactivation shall be directly controlled by pump pressure. The priming system shall be twin piston reciprocating type and shall be capable of priming from a depth of 3 metres within 12 to 20 seconds. The primer shall be capable of lifting water at least 7.0 metre in not more than 24 seconds when connected with 100 mm suction hose. Arrangement shall be made to actuate the primer in MANUAL mode also. When operating in Manual mode primer should be engaged simply by pressing a single Button/lever when it is needed. When operating in Auto mode, primer must be internally actuated and must automatically re-engage when pressure is lost. Priming system driven by any external belts/chain is not acceptable. The primer shall be preferably designed with a view to prime when the pump is running at speed of 1000 to 1500 rpm.

*Note:*—Details of Pump such as its make and model with full technical features, supported with catalogues, brochures, drawing etc. shall be attached with the offer. The drawing showing the pump performance curve shall be enclosed.

#### V COOLING SYSTEM

Indirect cooling system of open circuit type consisting of special heat exchanger shall be provided to the vehicle to enable full power output to be maintained during pumping duty without overheating.

#### VI POWER TAKE OFF (P.T.O.) UNIT

The PTO will be of heavy-duty capable of transmitting the full power of engine to the pump. The PTO unit will match the engine and pump characteristics, with suitable ratio. A separate lever in the main cabin will engage PTO. PTO Engagement mechanism shall be pneumatic based, with a stand-by mechanical over-ride lever provision. Necessary support for PTO units, propeller shaft couplings, universal joints etc. shall be provided. There shall be locking device on manual PTO lever to prevent accidental engagement/disengagement. The propeller shaft for connecting the pump shall be dynamically balanced as per requirement of chassis manufacturer. The drive assembly component (shaft, couplings) will be dynamically balanced. PTO shall have the following features:

- Automatic air-controlled self-locking gear shift mechanism using air power to shift from road to pump mode by actuation of single lever.
- Illuminated signal control indicators shall be provided in drivers cabin as well as on rear control panel to indicate shift gear-shift from road-to-pump mode and vice—versa.
- Mechanical linkage assembly for PTO-Prime mover-Pump, shall be supplied by OEM of pump/PTO and shall be acceptable to (As per the standards of ) the chassis manufacturer.
- 5 years warranty for P.T.O. and connecting drives shall be provided by the fabricator.

**Acceptable Make**

Fire-fly Fire Hawk Series or equivalent.

**VII WATER TANK:**

The water tank will be of 5000 litres capacity, fitted on the chassis so as to allow full flow of water to pump. All welded areas shall be smoothened by proper grinding. The design of the tank shall be such that the centre of gravity will be kept as low as possible. Tank will be cleaned and dried before painting. Tank will be given anticorrosive treatment from inside and outside after sand blasting. The water tank shall be installed on the Fire tender and shall have the following parameters:

Capacity	—	5000 Litres
Material of Construction	—	MS
Bottom Plate Thickness	—	5 mm
Side Plate Thickness (Die Pressed Stiffened on Two Sides)	—	5 mm
Top Plate Thickness	—	5 mm
Baffles Thickness	—	5 mm
Numbers and size of Manhole	—	1 × 450 mm
Numbers and Size of Cleaning Hole (Bottom of Tank)	—	1 × 250 mm
Drain Pipe on Cleaning Hole	—	50 mm
Overflow Pipe Size	—	50 mm
Tank Filling Line Size	—	80 mm
Number of Tank Filling Connections	—	1 × 63 mm

**Design and Plumbing:**

The water tank shall be designed to carry 5000 Litres of water. The tank shall be baffled in order to avoid surge when the vehicle is braking, accelerating and cornering. The manhole shall have a hinged cover so that the manhole will also act as a filling orifice. Suitable eyes (four Nos. of folding type lifting eyes) Shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repairs when required. The bottom of the hooks will be further strengthened with flange type plates mounted on the top of the tank to avoid any damage to the tank during the process of lifting off the tank.

A cleaning hole shall be provided at the bottom of the tank which will be fitted with a drain pipe and valve without reducing the effective ground clearance. The tank will be fitted with an overflow pipe taken down to a point well below the chassis that discharges the water away from the wheels. The overflow pipe shall be so designed and located to ensure that water will overflow through overflow pipe only while filling tank, but no water shall overflow through overflow pipe when appliance is in motion or negotiating up/ down gradient and / or brake is applied to the moving appliance.

Provision for hydrant connection incorporating a strainer shall be provided for filling the tank. A pipeline will be taken from the tank to the suction inlet of the pump incorporating a quick action butterfly valve. The tank will be connected with the pump in such a manner that pressurization of water tank or water tank to pump connection is avoided when pumping water from an outside source of supply. The plumbing between the pump and the hose reel will have a clear unobstructed waterway of not less than 25mm throughout. The water tank with its entire fitment shall withstand hydrostatic pressure of 0.3 kg/cm<sup>2</sup>.

**Baffles**

The tank should be suitably baffled to prevent surge while the vehicle is accelerating, cornering and braking. The design of the baffles shall provide access to all compartments for repairs and maintenance. The baffles shall be easily removable and only SS nut-bolts, should be used. The baffle shall be arranged in a manner to facilitate the movement of a person throughout the tank for cleaning and welding purposes.

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**TANK MOUNTING SYSTEM & TANK LEVEL INDICATORS****Sub-frame & Mounting System:**

The water tank will be mounted on the vehicle on sub-frame metacone mountings. This sub-frame will be made from anti-corrosive treated MS 4" section and will be bolted with the chassis using the high tensile bolts and nylock nuts. 'U' Bolts shall not be used for mounting of tanks on vehicle. The metacone mountings shall facilitate to absorb the jerks and bending torsions in expansion as well as compression mode without high deflection. The manufacturer shall provide complete design data of mountings and sub-frame including the load calculations and quantity sufficiency for approval before starting fabrication. Tank will be mounted on the chassis in a manner keeping in view the proper load distribution on the axles. Load distribution chart and detailed drawing from the competent authority shall be submitted for obtaining approval from the department, before commencing fabrication. The baffles will be arranged in a manner to facilitate easy cleaning of the tanks. The tank will be mounted on two/three cross bearers to counteract stresses caused by chassis flexing. The centre of gravity shall be maintained as low as possible.

A water level indicator will be provided near the control panel. The level indicator calibrated on full,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{4}$  and empty shall be of the graduated glass tube, clear acrylic or electronic type. In case of the graduated glass tube or the clear acrylic type, means will be provided to isolate the same from the tank for maintenance as well as to extend the life of the tubes.

**Primer Coating of surface for water tank**

Blast cleaned surface shall be coated with primer within 4 hours of sand blasting; steel may be given primer coat before and after fabrication. In either case, primer coat to a dry film of minimum thickness of 25 microns shall be applied. Touch up with primer shall be done again to welds, burnt and cut edges after fabrication. The water tank shall be given two coats of epoxy treatment inside and outside which shall consist of two coats of primer with two coats of epoxy finish and FRP coating with sufficient thickness should be done inside the water tank.

**VII HIGH PRESSURE HOSE REEL WITH GUN:**

1. One high-pressure hose reel shall be provided and fixed at suitable location on the rear of the vehicle. This hose reels shall be connected to H.P out let of pump with reputed make ball valve of suitable siz.
2. The design and size of hose reel shall be such that, it shall accommodate 60Mtrs. H.P. hose having 25 mm bore.
3. The HP hose reel shall be provided with High Pressure fog/Jet trigger type gun preferably AKRON/ROSENBAUER/ FIRECO/FIREFLY or equivalent.

**IX BODY WORK AND STOWAGE:****Body fabrication**

The Vehicle should be fabricated in aerodynamic design with single curved wind shield. Front wind shield glass, side glasses should be fitted as low as possible to provide the driver with clear visibility of traffic, in the front and on the flanks. The approximate size of wind shield should be with Height: 52", width: 85" and Thickness : 7.76 mm, and of high quality preferably with IS mark.

Timber shall not be used for body construction.

Cross members shall be of GI rolled channels of size 75 × 40 mm duly bolted to main chassis frame with high tensile bolts with nylock nuts. The entire structure should be framed from 2mm thick GI 32 × 32 mm square tube/formed section and locker sections with duly gusseted joints, to ensure a strong and rigid structure. The inner locker structure should be out of 30mm × 3 mm GI rolled angles duly gusseted and strengthened for sturdiness. No M. S Sheets should be used for either body panelling or in the lockers. 'Sunk-in' steps should be provided in chequered plate below the front bumper.

Aluminium sheet of 1.6 mm (16 gauge) shall be used for exterior panelling work all over. For the inner walls of lockers 1.25 mm (18 gauge) Aluminium sheet and for the floor of the lockers Aluminium chequered plate of 2.5mm thickness shall be used. The exterior panelling on top of the tank shall be made of 2.5 mm thick Aluminium chequered plate with sufficient reinforcement.

**Driver Cabin and Crew Cabin**

1. The cabin compartment shall provide enclosed accommodation to six persons including a driver and officer in charge.
2. The driver seat shall be adjustable-forward, backward & vertically and bucket type.
3. Seat belt shall be provided for both driver and officer seat.
4. At the rear end of the driver cabin, a crew seat running along the width of cab (with back rest) shall be fabricated in the form of a box with three compartment, one for the batteries, one for keeping spare BA Set cylinders with anti rolling fastener and the other for placing mechanical tool kit. The crew seat shall be enough for 4 persons.
5. All seats shall be cushioned with 100 mm foam and upholstered with good quality rexine.
6. All seats shall be rigidly fixed to the floor by means of nuts and bolts.
7. The cabin floor should be covered with 3mm thick aluminium chequered plate rigidly fixed to the under frame cross members by means of nuts and bolts or riveting. Trap doors for draining spilled oil or water shall be provided at proper places.
8. A grab bar shall be fixed in the cabin between the crew and the driver portion. It shall be strengthened by three vertical supports and the support shall be fixed rigidly.
9. The driver cum crew cabin shall be provided with four full doors, one for the driver, one for the officer and two doors on the rear of the cabin on either side for the crew, ie, on one side there shall be two doors.
10. All the four doors shall be fitted on the super structural members, each hung upon three invisible coach type mild steel stout hinges and fitted with best quality handles.
11. All the four doors of the cabin shall be fitted with toughened glass with proper closing and opening mechanism.
12. All the four doors shall be hinged, opening outwards, hanging forward and shall have catch locks and flush type handles provided outside. Door stoppers shall be provided to restrict the door opening to a maximum of 100° from the closed position.
13. Locking arrangement shall be provided for the driver door from outside.
14. All other doors shall be lockable from inside. In addition to the doors locks, aluminium tower bolt of 200 mm shall be provided for all the doors from inside.
15. Adequate grab rails shall be provided for easy embarking and disembarking.
16. The cabin shall be panelled externally with 1.6 mm aluminium sheet.
17. The interiors would be aesthetically finished so as to give a pleasing appearance with high quality workmanship. All joints as well as vertical and horizontal corners shall be neat and smoothly finished. The inside panel of sides and end walls will consist of 8.0 mm thick pre laminated board. Joints will be covered with anodized aluminum strip. False ceiling with approved ceiling sheet will be provided.
18. The floor of the cabin shall be panelled with good quality PVC coated 3 mm aluminium sheet.
19. The construction of cab shall be such that the roof shall support the weight of two men without any damage. The cabin roof top should be covered fully by 1.60 mm aluminium chequered plate.
20. One roof light (LED Type) shall be provided in the driver cabin.
21. The driver shall be provided with two large size rear view mirrors with convex round mirrors for overall rear view of the vehicle from top to bottom and left to right but should not obstruct the vision of the driver while driving through curves.
22. The rubber beading used for fitting glasses and window frame shall be EPDM rubber



23. A fire bell of 250 mm diameter shall be provided on the rear left hand side of the cabin (above firemen seat) and arrangements shall be so made to enable the fireman to ring the bell from inside the cabin
24. Wire mesh guards shall be provided for front wind screen glass, side door glasses (4 numbers), light bar, head lights, fog lights and for rear lights. These wire mesh guards shall be of removable type, fitted with wing nuts.
25. Fabrication shall be done in such a way that no rattling sound is produced while running/operating the vehicle, by providing adequate sealing/ packing materials. The cabin and locker should be of composite construction with sufficient rigidity, reinforcement and to be kept as light as possible.
26. A First aid box shall be provided in the cabin. Drain holes shall be provided preferably at the bottom of the crew cabin.

#### OTHER WORKS:

Guards shall be provided for propeller shafts.

Suitable brackets should be provided on top of the tank for the spare wheel.

Drag Hook or Eye of adequate strength and design will be provided at the rear and front of chassis.

No modification/connection shall be made in compressed air passage lines of the vehicle for any tapping of air. For any such requirement the free port of the DD unit of the compressed air system shall be made use of.

#### 1. Lockers:

Lockers shall be provided for secure stowage of all equipment given in this specification. The height of the lockers from the bottom to the top of the opening shall be not less than 600 mm and the depth shall be not less than 600 mm. All lockers shall be provided with internal automatic lighting arrangement with the master switch in the cab. All lockers above chassis floor and the rear side of the appliance shall be covered with aluminium roller shutters. The roller shutters shall be made from extruded aluminium sections with suitable roller, spring, guide channels, etc. All aluminium sections used shall be properly anodized. The roller shutters shall be rolled inwards underneath the roof giving unobstructed access to the equipment lockers and the fire fighting material. These roller shutters shall open in every position of the vehicle even in rough terrain. Guide rails shall support the shutters over entire length on both sides to make them absolutely torsion free. The roller shutters shall have a sturdy lock, preventing accidental opening during movement of vehicle. Roller shutters shall be made of hollow rectangular shaped aluminium links which shall be inter connected with rubber/plastic/PVC profiles sealing the roller shutter watertight when closed. The complete shutter assembly, the side, bottom and main profiles as well as the locking system shall be from the shutter manufacturer only. These roller shutters shall be durable, maintenance free, weather and corrosion resistant.

**Preferable make(Shutters): Ziegler, MCD, Rosenbauer or equivalent**

#### 2. Stowage of Equipment:

For all water fittings like branch pipes, etc, quick release type couplings shall be provided which enables the operator to locate the desired equipment instantly and thereby save valuable time at the time of fire. These couplings also ensure that none of the item damage the internal panelling and thereby increase the life of the vehicle. Suitable clamps, brackets, holders, etc, are provided for all other items.

#### X ELECTRICAL SYSTEM:

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 fitted with means for carrying spare fuses. The wiring should be double pole and should not be exposed to the atmosphere. Conduits shall be used wherever necessary. All equipment lockers should have individual lights which will automatically switch ON when the shutter is opened (which will be fully LED based) and these should be operated by means of a master switch on the dash board in the driver's cabin.

The switch for the light/siren should be provided on the dash board.

**OTHER ELECTRICALS**

Two fog lamps and two spot lights shall be installed in the front on an extra pipe. Blinker type traffic indicators provided by the OEM shall be maintained in the vehicle after fabrication. Protective wire net shall be provided for all lights and indicators. 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.

A spot light not less than 30W (LED) power shall be provided at the rear portion of appliance near the pump which can be rotated horizontally by 180°.

Two-tone hooter cum P. A. System having 25 watt capacity with speaker, LED Light bar with red, blue and white flasher lights of minimum 75-100 watts and not less than 1000 mm size shall be mounted on the cabin roof with amplifier in the cabin.

**Mechanical siren-100w shall be provided.**

One pair of additional electric horn shall be provided.

Reverse gear and indicator buzzers shall be provided.

L.E.D Mini Light bar (Flasher) shall be provided on both sides. (3Nos. each on Both side ) They shall be fitted integrally to the body.

**XI REAR OF THE APPLIANCE:**

- (a) Strong grab rails with support at the rear should be provided. Strong Aluminium grab rail support on top of the appliance, on either side, running from behind the cabin roof top to the rear foot board level of the appliance shall also be provided.
- (b) The entire rear portion other than the foot board shall be covered with 2.0 mm aluminium chequered plate and the foot board shall be covered with 2.5 mm aluminium chequered plate.
- (c) A small ladder fabricated out of 1" dia. 2 mm thick M.S. tubular pipe shall be provided and fitted at the rear of the vehicle to climb on the top of the vehicle.
- (d) An adequately illuminated control panel shall be provided near the pump and easily accessible to operator for operating different controls.
- (e) The control panel of the rear should have following arrangement.
  1. Throttle Control for engine.
  2. Compound gauge.
  3. Pressure gauge (High pressure).
  4. Pressure gauge (normal pressure).
  5. Primer valve control.
  6. Cooling water valve.
  7. Tube type level indicator showing level of water in the tank.
  8. Suitable panel lights and all other required items.
- (f) The main pump, hose reel system and the pump control panel shall be covered with Rolling Shutter at the rear of the appliances.

**XII REAR VIEW CAMERA:**

Rear view camera shall be provided for the vehicle with 7 inch LCD screen within the cabin. The camera shall have minimum 120° field of vision with a 1/3 inch image sensor.

**XIII LADDER AND LADDER GALLOWS:**

A 10.5m aluminium double extension trussed type ladder shall be supplied along with the fabricated vehicle and ladder gallows shall be provided with rollers for carrying the same. The mounting of the ladder shall be such that the ladder shall not extend outside the length of the vehicle when stowed. Means shall be provided for locking the ladder when it is stowed.

## XIV WORKMANSHIP AND FINISH:

Workmanship executed shall be of the highest order. All rivet and bolt holes shall have a coat of approved paint on both surfaces before riveting or bolting or welding. All steel screws, bolts, nuts, rivets etc, shall be zinc coated or shall have rust proof coats by a recognized process. All the sharp edges shall be grinded. The roof joints shall be subjected to rigid water test at vendor's workshop in presence of purchaser's representatives. All directions and instructions given at any stage of fabrication by the purchaser / representative for quality and workmanship on all points related to the fabrication shall be executed. All the material used in the fabrication of the body work shall be of good quality. All equipment and material shall comply with the requirements of the latest relevant IS specifications.

Any other equipments/fabrication are necessary to perform the normal functioning of the water tender if any, which are not mentioned above should be supplied/done by fabricator.

## XV PAINTING:

The crew cabin shall be painted cream. Necessary anti corrosion and primer coat in pink colour shall be applied before painting. The body shall be painted Fire red in colour conforming to shade No. 536 of IS 5: 2007. The paint shall conform to IS 2932:2003. The whole vehicle shall be painted internally and externally with one coat of zinc chromate and an under coat, two finishing coats and clear coat. Phosphating and painting of the chassis shall be carried out to withstand Seasonal climate effects. The words "KERALA FIRE & RESCUE SERVICES" shall be painted in letters of 10 cm height on one side on the body of vehicle in golden yellow colour paint. Same text in "Malayalam Font" shall be painted over the other side in same manner. The name of the Department "KERALA FIRE & RESCUE SERVICES" in form of sticker in fluorescent red letter in yellow background shall be affixed on the top of the front wind screen glass. Emblem of the Department shall be affixed on either side of the cabin front Door (Model shall be provided by the Department) 'Dial 101' shall be written on all the four sides of the vehicle on yellow background in black letters.

XVI ACCESSORIES: The following accessories shall be supplied along with each vehicle.

<i>Sl. No.</i>	<i>Particulars of Accessories</i>	<i>Qty.</i>
(1)	(2)	(3)
1	Heavy duty plastic DUTRON or equivalent coupled with round threaded gunmetal couplings suction hoses of 100 mm of in 2.5m. Each hose to be of a length to be kept just above the water tank in special brackets. (Gun metal/brass)	4 Nos.
2	Suction Metal Strainer 100mm (Gun metal/brass)	1 No.
3	Basket Strainer	1 No.
4	Suction Wrenches, (universal type)	1 Pair
5	<b>Delivery Hose</b> It shall be non-percolating and synthetic type B. Minimum length shall be 15m Shall be provided with instantaneous male and female couplings of size 2½" (Gun metal/brass) size of the hose should be 2 ½". Delivery Hose should comply with latest IS-636.	15 Nos.
6	Standard Brach pipe with 19mm Nozzle (Gun metal)	2 Nos.
7	Foam Making Brach FB 2 with Pick up tube	1 No.
8	Portable fire extinguisher, ABC Type, 6 kgs capacity, ISI marked	2 Nos.
9	Portable fire extinguisher, CO2 type, 4.5kgs capacity BIS marked	2 Nos.
10	Shears/Bolt cutter—28" Preferable make-Everest/Jhalany/Taparia or equivalent	1 No.
11	Shears/Bolt cutter—36" Preferable make-Everest/Jhalany/Taparia or equivalent	1 No.
12	Fireman's Axe (Insulated and tested for 30,000 KV)	1 No.
13	Sledge hammers of 2.5 kg	1 No.
14	Sledge hammers of 5 kg	1 No.

(1)	(2)	(3)
15	Nail hammer	1 No.
16	Crowbar 20 mm. dia. of 1.5 meter	1 No.
17	Crowbar 25 mm. dia. of 2.0 meter	1 No.
18	3 way Suction Collecting head(100 mm) (Gun metal/Brass)	1 No.
19	Dividing breeching with control valve (100 mm) (Gun metal/Brass)	1 No.
20	Collecting breeching instantaneous (100 mm) (Gun metal/Brass)	1 No.
21	Fog nozzle with extension applicator with fog head ( <i>see</i> IS 952)	1 No.
22	Branch with revolving head ( <i>see</i> IS 906) (Gun Metal)	1 No.
23	Nozzles of size 12 mm, 16 mm, 20 mm & 32 mm ( <i>see</i> IS 903)	1 each
24	Adaptor for 100 mm suction female screw coupling and 63 mm male instantaneous (Gun metal/Brass)	1 each
25	Adaptor double female instantaneous pattern 63 mm (Gun metal/Brass)	1 No.
26	Adaptor double male instantaneous pattern 63 mm (Gun metal/Brass)	1 No.
27	Nozzle spanner ( <i>see</i> IS 903)	1 No.
28	Nylon rope-50 mm-40 metre long having two ends spliced in and one end with a running noose	1 No.
29	Poly Propylene rope-50 mm-50m long	1 No.
30	Door breaker	1 No.
31	Kern mantle rope-14 mm dia, length-50m, Sewn thimble eye at one end, Sewn end-stop termination at other end	1 No.
32	Hydraulic jack—Not less than 7.5 ton capacity	1 No.
33	Fire hook ( <i>see</i> IS 927)	2 Nos.
34	Fire rake	3 Nos.
35	Grease gun	1 No.
36	Axe-large (weight not less than 3 Kg)	1 No.
37	Hose bandages, Hose Slings, Hose Straps	20 Nos. each
38	Rubber gloves (IS:4770) in pair	2 Nos.
39	Asbestos Gauntlets in pair	2 Nos.
40	Tool kit Double End spanner set 6mm to 36mm, Ring spanner set 6mm to 36mm Box spanner set 6mm to 36mm with Ratchet, T- bar and Extension Rods etc. Allen Key Set, Insulated plier 8", Screw Driver with insulated handle 8", flat/Square tip of different sizes (Flower bit) ,VICE GRIP PLIER: Size - 10" length (Should have teeth on both jaws Made of forged steel), Cold Chisel, Adjustable Wrench 12" & 24". etc. Shall be quality products and arranged in a Metal Carry box properly.	1No.

(1)	(2)	(3)
41	<p>Rechargeable Battery operated Portable LED Light The light should be powered by a rechargeable 28 Volt LI-ION Battery having average run time of 7Hours at Low Light output and 1 Hour at High Light output.</p> <p>Light should be able to give the output performance as follows.</p> <p>High—Not less than 14,000 Lumens.</p> <p>Medium—Not less than 8,000 Lumens.</p> <p>Low— Not less than 2,000 Lumens.</p> <p>Spot—Not less than 5,000 Lumens.</p> <p>Light should be able to provide light pattern of Flood and Spot as per requirement and these adjustments shall be done with the help of Toggle switches.</p> <p>The light should have mounting options such as Hang, Strap, Spike and Set.</p> <p>The Frame should be of powder coated stainless steel, having large ergonomic carrying handle, friction swivel for quick deployment.</p> <p>Weight of the Light Set (Light + Battery) should not be more than 5.5Kg.</p> <p>The complete set should be water proof as per IP66 rating. Light assembly should have a Warranty of Minimum 6 Years, Battery and Charger should have minimum 1 Year Warranty. Set should be supplied with following accessories.</p> <p>Battery Charger (230Volt A/C)—1 No.</p> <p>Mounting Bracket—1 No.</p> <p>Storage Case—1 No.</p> <p>Preferable make: ELRE-SCOUT or equivalent.</p>	1 No.
42	<p>Multi Purpose Nozzle</p> <p>Should be Dual shut-off type for combination of penetrating solid bore and fog pattern with pistol Grip, Shut-Off Bale Handle and Spinning teeth</p> <p>Material of construction:</p> <p>Pyrolite material for body and swivel</p> <p>Zytel material for Bale handle and Celcon Shut-off balls.</p> <p><b>The device should be so designed to minimise the jet reaction.</b></p> <p>Weight Approx. 4kg</p> <p>Max Flow: 510lpm @ 7bar/100psi</p> <p>Should operate efficiently at pressure of 50psi to 100psi</p> <p>Size of water inlet should be 63mm.</p> <p>Should meet NFPA 1964 standard.</p> <p>Should have 10 year manufacturer standard warranty</p> <p>Preferable Make—AKRON 1525ZT or equivalent.</p>	2 Nos.

#### XVII INSPECTLON & ACCEPTANCE TESTS:

The following stage inspection and acceptance test shall be given to the complete 5 satisfaction of the owner. All the testing parameters should be carried out at the manufacturer's premises and the details (photographic evidence) of the testing infrastructure shall be provided. Vendor shall ensure that design of tender will not affect chassis parameters such as speed, turning circle, acceleration etc.

#### First Stage

Structural work and Measurements, Structural framework, panelling not started. Materials for panelling ready for measuring.

**Second Stage**

Panelling work, Tank ready not mounted (for hydraulic pressure testing), Pump ready not mounted (for hydraulic pressure testing), platform of water tank, pump and PTO ready for mounting. All the piping shall be subjected to hydraulic test pressure of 15 Kg/cm<sup>2</sup> for a period of min 10 minutes. The pump casing shall be subjected to a hydraulic test pressure of a minimum 52.5 Kg/cm<sup>2</sup>. Tank shall be hydro tested at a minimum pressure of 0.3 bar for a period of one hour before mounting on the vehicle.

**Final Stage****Stability:**

Stability of appliance will be such that when fully equipped & laden, if the surface on which the appliance stands is tilted to either side at an angle of 27° from horizontal it will not overturn

**Gradient:**

The vehicle will be tested on a gradient test ramp at an angle of 1:4 as per BIS.

**Endurance Test:**

The pump will be tested for a continuous period of four hours non stop & the water will not be replenished during this test & the engine will not show signs of over heating. The testing charges for the same shall be borne by the vendor.

**Priming/Deep Lifting Test:**

The priming shall be tested as per the latest standards & the system shall be subjected to a test at a suction of 7 Mtrs. The priming should be achieved in less than 24 seconds.

**Articulation Test:**

The vehicles shall be tested for articulation and shall not show any signs of stress during this test. The clearance in the wheel wells shall be checked for tolerances.

**Road Test:**

After completion of all the above mentioned tests, a road test shall be carried out where the vehicle shall be tested for its performance. The braking, acceleration & top speed tests shall be checked & recorded by the inspecting officers.

**XVIII SPECIFICATIONS AND DRAWINGS:**

Considering the detailed Specifications, the Auto CAD drawings (Hard Copy as well as Soft Copy in pdf shall be included) should be submitted by the Vendor. The Director General, Kerala Fire & Rescue Services or his representatives may suggest modifications to the drawings. However, modified drawing should be submitted by the Vendor within 3 days from the suggestion/discussion. The Bidder shall start the work only after getting the drawings approved by The Director General, Kerala Fire & Rescue Services. The CAD drawings should clearly illustrate the detail. Two sets of complete and final CAD Drawings (both the Hard Copy as well as Soft Copy shall be included), in respect of fabrication, stowage arrangements, fittings, electric circuit arrangement etc. shall be supplied at the time of delivery of the appliance. These drawing shall be supplied free of charge.

**XIX INSTRUCTION BOOK:**

A detailed instruction book in ENGLISH for the guidance of the user shall be prepared and supplied. It shall contain the details of operation, maintenance and proper use of the vehicle, all the appliances and equipment.

**Acceptance:**

The fully fabricated vehicle with all equipment and accessories shall be delivered at Fire & Rescue Services Headquarters, Thiruvananthapuram Free on road. The delivered vehicle shall be inspected by a board of officers for the general functioning of vehicle and associated equipment and accessories. The vehicle shall be accepted by the Department based on this report.

## CONDITIONS

1. Essential documents to be submitted along with the Tender : Pamphlets, Photograph, Drawings, CD etc.
2. Period of delivery : Within 120 days from receipt of supply order.
3. F.O.R. : Thiruvananthapuram.
4. Payment : Payment for Chassis: Full payment for chassis against bank guarantee as per KFRS format for equivalent value and this shall be payable against copy of invoice for chassis from chassis manufacturer certified by the successful bidder and after verification and certification of readiness of chassis by officials of KFRS.  
Balance payment against delivery of water tender a Thiruvananthapuram and acceptance by an acceptance committee of KFRS.
5. Warranty : A Warranty of 36 months for fabrication. All other items for which the warranty period is not specifically mentioned in the specification, a warranty of 36 months from the date of acceptance will be applicable. Chassis manufacturer's warranty norms will be applicable for the chassis.
6. OTHER SPECIAL CONDITIONS:
  1. As the Water Tender is a composite item, both procurement of chassis and fabrication of Vehicle shall be done by the fabricator and all bidders have to quote for both items. L-1 bidder shall be decided on overall basis.
  2. EMD—1% of PAC in online payment.
  3. Security Deposit—5 % of total contract amount to be furnished as mentioned in the Notice inviting e-Tender, which will be released after the expiry of the warranty period.
  4. Any firm whose Proprietor, Partner or Director is involved in a Vigilance Case has been charge sheeted and pending trial at court in connection with fabrication/ supply of similar product made earlier to this Department/Kerala Government are not eligible to participate and shall be barred from participating in this tender.
  5. The tenderers should produce latest solvency certificate of ₹ 5 Crores or more and should have an average annual turnover of ₹ 3 Crores for the last 3 Years.
  6. The bidder should have sufficient previous experience in fabricating Fire fighting vehicles (Atleast 15 water tenders/Emergency tender should have been fabricating by the bidder during the last three years). The copies of supply order for fabricating Fire fighting vehicles, placed by States, Union Territories, and Public Sector Undertakings during the calendar year 2014, 2015 & 2016 should be produced in support.
  7. On receipt of the supply order the tenderer should provide Insurance cover for the Kerala Govt. Property for an amount equal to the cost of total number of chassis for fire and theft.
  8. The brand new chassis shall be purchased by the bidder and registered in the name of the Director General, Kerala Fire and Rescue Services. Renewal of temporary registration processes shall be performed by the fabricator at their own expense. A valid Temporary Registration Certificate (T. P.) shall be produced before the department at the time of delivery.
  9. The load distribution chart and detailed drawing from the competent authority shall be Thiruvananthapuram.
  10. The vendor shall be responsible for the maintenance of the Water tender for any defects or damages to vehicle due to bad workmanship or of any inferior material, accessories, apparatuses etc.
  11. The vendor should provide service assistance and supply of spare parts for a period of minimum 5 years after the expiry of warranty period, within 30 days since any complaint is reported to the vendor.

12. Anybody attempting to offer bribe or otherwise influence in any manner the officials of the Kerala Fire and Rescue Services or its supervisory levels in the Government will be disqualified.
13. The chassis shall be collected by the vendor from the Chassis supplier Location. The fabrication shall start only after getting clearance from the department after the inspection of the chassis by the Departmental officers at the yard of the fabricator. Final Registration of the vehicle will be arranged by KFRS after the completed vehicle is delivered to the KFRS. The vendor shall take temp. registration of completed vehicle & submit all relevant documents to the KFRS for final registration.
14. Bank Guarantee for the chassis shall be valid for a period till the chassis with complete fabrication is delivered to the KFRS. In case the delivery of vehicle is delayed beyond the delivery schedule, the vendor shall extend the Bank Guarantee for entire period till vehicle is delivered at KFRS site.
15. After purchasing the chassis by the vendor and till such time the fully fabricated vehicle is delivered to the KFRS, it shall be the vendor's responsibility to protect the chassis from damage, accident, pilferage etc.
16. Any modification like Welding, drilling etc. on framework of chassis should be done only as per the guidelines given by the chassis manufacturer.
17. Any restriction on performance of chassis, observed during/after execution of order shall have to be rectified by vendor in consultation with KFRS and chassis manufacturer. Such corrections shall be done at no extra cost to KFRS. The vendor shall be responsible for supplying all equipment/accessories and properly fixing them on the chassis as described in the specification. Other details and requirements which are not covered under the specification, but may be necessary to complete the Water Tender and/or to fulfil the operation/ performance requirement shall be provided by the vendor, who shall be responsible for the designing, engineering and construction of the complete appliance to the full satisfaction of the KFRS.
18. At the end of complete fabrication of Water Tender, the vehicle with fully laden conditions shall be checked and certified by vendor for correct load distribution on individual axle. The actual individual load on axle shall not exceed the allowable limit specified by chassis manufacturer or regulating authority, whichever is lower. Chassis supplier shall be called at the vendors site to verify the correct load distribution & fabrication of vehicle as per guidelines of chassis supplier, and a certificate shall be produced to the KFRS from the competent officials of the fabricator firm that the load distribution of the fully loaded vehicle on each axle is within the permissible limits of the chassis manufacturer.

Office of the Director General,  
Fire and Rescue Services Headquarters,  
Thiruvananthapuram.

A. HEMACHANDRAN, I.P.S.,  
*Director General.*