

OFFICE OF THE SUPERINTENDENT OF POLICE (FIRE & EMERGENCY SERVICE)
MEGHALAYA ::: SHILLONG.

NOTICE INVITING TENDER

Sealed Tenders are invited for fabrication of Ashok Leyland Chassis COMET GOLD 1616 (H)- 4330 MM .into **Water Tender Pump** and fabrication of **Mini water Tender with high pressure pump based on water mist technology** on 207 DI Pick up Chassis. The Sealed Tenders will be received upto **1200 Hrs. on 11.July.2011** and will be opened on the said date at **1300 Hrs.** by a Tender Opening Committee in the office of the Superintendent of Police (F&ES), Meghalaya, Shillong. Tenderers or their authorized representatives are invited at the time of opening the Tenders. Tenders received after **1200 hrs** by hand or by post will be summarily rejected.

TERMS & CONDITIONS:-

1. Tenders must be accompanied by the following: -
 - a. Non-refundable Court Fee Stamp of Rs. 2,000/-(Rupees Two Thousand) only .
 - b. Earnest Money of Rs.2,81,912/-(Rupees Two lakh Eighty One Thousand Nine Hundred Twelve) only pledged in favour of the Superintendent of Police, Meghalaya, Shillong from any Nationalized Bank or General Post Office at Shillong in any of the following form free of interest.
 - (i) Crossed Bank Draft.
 - (ii) Deposit at Call.
 - (iii) Fixed Deposit.
 - (iv) NSC/KVPTenderers belonging to Schedule Castes and Scheduled Tribes may deposit 50% of the earnest money mentioned above.

NOTE: Earnest Money of the past tenders which is yet to be release by this office will not be considered for this instant tender.
 - (c)
 - (i) SC/ST Certificate.
 - (ii) Attested copy of V.A.T. Clearance Certificate & V.A.T. Registration Certificate with list of items registered therein.
 - (iii) Attested copy of Professional Tax Clearance Certificate.
 - (iv) Attested copy of recent passport size photograph of the tenderer.
 - (v) Financial Stability Certificate from Scheduled Bank duly attested.
 - (vi) Dealership Certificate from genuine fabricator of firefighting vehicles registered with N.S.I.C. or equivalent, all details including the past experience of the fabricator is also to be submitted by the tenderer.
 - (vii) In case the firm is intending to do the fabrication by themselves, the following documents should be furnish by the firm:-
 - a) Registration Certificate of the Firm's Workshop/Industry with the Director of Industries.
 - b) I.S.O. Certification of the Firm's Workshop/Industry.
 - c) Past experience details of fabrication of fire fighting vehicles in the workshop/industry.
 - d) Location, address and full detail of the Workshop/Industry.
 - (viii) Where the tenderer or his principal have any existing and valid rate contract with DGS & D, an authenticated copy of such rate contract should be furnished.
 - (ix) Tenderer who are required to obtain trading licence in terms of Khasi Hills, Jaintia Hills and Garo Hills Districts (Trading by Non-Tribal Regulation, 1954) as amended from time to time, must produce an attested copy of such valid licence.
2. Rates: -
 - a. Should be quoted in figure and in words.
 - b. Should be quoted F. O. R. destination i.e. Supdt. of Police, (F&ES), Meghalaya, Shillong. Provincial Stores (Fire Service), Nongthymmai, Shillong or as directed by the Department.
 - c. Should be inclusive of all charges, insurance and other incidental charges, only Local Tax may be shown extra, if applicable.

- d. Should be written clearly in figures and in words. Any alteration or overwriting must be fully signed and sealed by the tenderer himself / herself.
3. An undertaking should be submitted by the tenderer before opening of the sealed tender stating that he/she is satisfied with the terms & condition of the N.I.T. and agree to abide by the same. In case of failure to submit the undertaking, the sealed tender of the particular firm will not be opened and will be returned back accordingly.
 4. The rate should be tendered for the complete item of work including all accessories, equipments as per specifications at Annexure 'A' & 'B'.
 5. The tenderer or their representatives/agents must be present during the tender opening alongwith their firm's seal and authority letter in case of representatives/agents. Whatever objection is to be raised should be done during the Tender Opening Proceeding. Raising objection after the completion of tender opening proceeding will be treated as null & void and the undersigned is not bound to entertain such objections.
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6. If at the time of opening of tender, should there be any objection raised by the majority of the tenderer/representatives present as to validity of the tender, the objection will be duly examined by the Tender Opening Committee whose decision on such objection will be final and binding and tenderer will have no right to raise objection on the decision of the Tender Opening Committee.
 7. Tenders must be addressed to the undersigned by designation and not by name. On the sealed envelope containing the tender, the words "Tender for Fabrication of Fire Fighting Vehicles/Appliances" should be superscribed and the firm's seal should be stamped on the body of envelop.
 8. Tenders must be sent by registered cover or hand delivered.
 9. Tenders without furnishing all the required papers/documents will automatically stands rejected.
 10. Risk of transportation of the fire fighting vehicles/appliances will be borne by the tenderer themselves after fabrication.
 11. Tenderers must be prepared to accept item-wise rate, if offered by the department, otherwise their earnest money will be forfeited.
 12. The successful tenderer/tenderers will: -
 - i) be intimated by a letter of acceptance by the office of the Supdt. of Police (F&ES), Meghalaya, Shillong. Till then, no tenderer has any right to assume that his/her tender has been accepted. There shall be no claim whatsoever for compensation for any expenditure incurred by any tenderer in anticipation of acceptance letter.
 - ii) have to submit Proforma Bill as and when called for and should comply with the requisition at any cost. Failing to comply with any of the demand/requisition made by the undersigned will invite forfeit of Earnest Money.
 - (ii) be required to furnish a security deposit @ 10% of the Total work value for all and execute a contract agreement to ensure fulfillment of the terms and conditions of the contract which the successful tenderer (s) will have to enter into. Such security deposit will be subjected to forfeiture in case of non-fulfilment of any or all terms and conditions of the Contract Agreement and the N.I.T.
 - (iii) The earnest money of the successful tenderer (s) will not be released till he/she has furnished the full security deposit.
 - (iv) Earnest Money of the successful tenderer (s) will be forfeited to the Government in case of failure to furnish the security deposit in full.
 - (v) Rate of security deposit is 10% of the work value for all.
 - (vi) Furnish an Indemnity Bond on appropriate stamp paper and a comprehensive insurance cover for the entire cost and safe custody of the chassis until fire appliances are fabricated and delivered to the department.
 - (vii) Receipt of the chassis by the fabricator at the fabrication site should be intimated to the undersigned immediately and without any undue delay.
 - (viii) Furnish a Guarantee against defective materials or inadequate design or workmanship for a period of eighteen months from the date of delivery of fabricated vehicles.
 - (ix) Security Deposit shall be released only after expiry of the guarantee period.
 - (x) Once the rates offered in the tender are accepted, no enhancement of rates will be allowed under any circumstances and the tenderer (s) will be liable to fabricate at the rates

accepted by the Supdt. of Police, (F&ES), Meghalaya, Shillong. Failure to fabricate at the accepted rates will entail the offer being cancelled and the security money forfeited to the Government of Meghalaya.

13. Fabrication must be of the same specifications and quality as offered in the tender.
 14. Delivery must be completed within Ninety days from the receipt of the firm order and chassis. No extension of delivery period will be entertained.
 15. Payment will be made to the successful tenderer/tenderers directly only on the completion of fabrication and on full and correct receipt of the vehicles by the department in good working conditions. Documents / Vouchers / RR Bills etc routed through Banks will not be accepted.
 16. In the event of the successful tenderer/tenderers failing to perform his/her part of the Contract to the satisfaction of the department or disregarding any terms and conditions of this tender notice or the Contract agreement, the successful tenderer/tenderers will be liable to any or all of the following actions at the discretion of the Supdt. of Police, (F&ES), Meghalaya, Shillong.
 - (i) Forfeiture of the security deposit.
 - (ii) Making good the loss caused to the Government through the liabilities, neglect or delay in complying with the demand.
 - (iii) Cancellation of the contract without any prior notice.
 17. All losses sustained by the Department/Government due to failure, omission or neglect of the successful tenderer (s) will be realized from his or her security deposit and if the recovery from the security deposit is not sufficient the successful tenderers shall be liable to pay the compensation as shall be fixed by the Department/Government accordingly.
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18. In the event of rejection, failing, declining, neglecting or delaying to comply with any demand or requisition, the undersigned shall be at liberty, without prejudice to any other remedy the department may have on account of any claim for compensation against loss and inconvenience caused by such breach, to order purchase at the expense of the successful tenderer (s) such supply as may have been rejected, or failed, neglected or delayed to supply or any excess cost incurred over the accepted rates. The successful tenderer (s) shall be liable to pay such compensation to the Government in full.
 19. The undersigned may rescind forthwith the contract in writing if successful tenderer/tenderers: -
 - (i) assigns or sublets the contract without his approval in respect of the contract or any other contract entered into with the Government.
 - (ii) his agent or servant are guilty of fraud in respect of this contract or any other contract with the Department or Government.
 - (iii) declines, neglects or delays to comply with the demand or requisition or in any other way fails to perform and/or observe any condition of the contract.
 16. Chassis will be released by this department through the nearest Sale Centre to the successful tenderer/tenderers fabrication site.
 17. The undersigned reserves to himself the right to reject any or all tenders without notice nor assigning any reasons thereof.
 18. The acceptance or rejection of the tender rest finally with the undersigned and reserves the right of rejecting any tender or any item in the tender without assigning any reason thereof.
 19. The Authority is not bound to accept the lowest tendered rates.

Sd/-
(Shri D.M.Sangma, M.P.S)
Superintendent of Police, (F&ES),
Meghalaya, Shillong.

Encls: "Annexure "A" & "B".

Memo No MFS/A-35/ CS/2009-10/64/

Dated, Shillong the 10th June/2011.

TECHNICAL SPECIFICATION FOR WATER TENDERTYPE B FOR FIRE BRIGADE USE

1. GENERAL REQUIRMENTS

1 CHASSIS

The chassis will be Ashok Leyland Chassis COMET GOLD 1616 (H)- 4330 MM (170.5") WB goods Chassis fitted with BS III diesel engine, 5 speed synchromesh gear box, power steering , spare wheel carrier and rim , wiper motor, steel front end structure, RUPD, mirror suppressor, tool kit and CMVR Kit, Hydraulic jack (3+4) 10.00 x 2016 PR PD Nylon tyres, and the same will be supplied by the department.

2. PUMP:

2.1 The pump shall be centrifugal type, multi pressure, having out put capacity of 2000 LPM at 7 Kg/cm² and 300 LPM at 35 Kgs/cm² at 3 meters suction lift at NTP condition. The low pressure side will be of single stage and the high-pressure side also with single stage having regenerative type impeller.

2.2 The pump shall comply to the following performance parameters.

- | | | | |
|----|--|---|--|
| a) | Normal Pressure output | : | 2000 LPM at 7 Kgs./cm ² |
| b) | High pressure output | : | 3000 LPM at 35 Kgs./cm ² |
| c) | Maximum pressure in normal mode | : | 14 Kg/cm ² (shut off pressure) |
| d) | Maximum pressure in High pressure mode | : | 45 Kg/cm ² |
| e) | Deep lifting capacity of Pump . | : | 30 cm/sec. max. upto 7 Meters in 30 sec. at NTP Condition. |

2.3 The overall pump shall be constructed from gunmetal. The normal (low) pressure impeller, volute, and impeller wearing shall be made from gunmetal confirming to Gr II of IS 318/1981 and the regenerative type high pressure impeller shall be of Aluminum, Bronze (AB-2). The pump shaft shall be made form stainless steel confirming to IS 6603/1972. The bearing housing will be made of C.I. and all the studs and bolts coming in contact with water shall be of stainless steel. The bearing used in the pump shall be of reputed make

2.4 The normal and high-pressure impeller shall be mounted on a single shaft and normal (low) pressure impeller shall be dynamically balanced.

2.5 The pump shall be provided with self adjusting mechanical carbon seal with interface plate. The mechanical seal assembly shall with stand dry running of pump upto 2 minutes without any damages.

2.6 The pump shall be provided with an inbuilt filter of easily removable type, which shall filter the water before entering into the high-pressure stage impeller.

2.7 Operation of low pressure to high pressure or vice-a-versa shall be possible by actuation of single lever.

2.8 The pump shall have facility to operate low pressure and high-pressure mode simultaneously or individually. While high pressure mode is in operation and delivering 300 LPM at 35 Kg/cm², the pressure in low pressure in low pressure side shall not exceed 8.5 Kg/cm².

2.9 The size of high-pressure outlet shall be of 25 mm connected to high-pressure hose reel.

2.10 The pump shall be provided with one suction inlet of 100 mm dia. having round threads confirming to IS: 902 of 1974 and TWO numbers of 63 mm delivery outlets having screw down

type valves fitted with instantaneous couplings as per IS 903/1993. The delivery valve spindle sealing shall not be of gland type. The high-pressure outlet shall not be less than 25 mm and shall either be flange on screw type.

- 2.11 The efficiency of the pump shall be such that the power and RPM required shall not be more than available with the engine.
- 2.12 The pump housing shall have provision to connect to internal cooling system.
- 2.13 The pump shall be mounted at the rear of the vehicle connected to P.T.O. by propeller shafts and universal and slip joints with sufficient number of bearing supports.
- 2.14 Pump primer – The priming system shall be Reciprocating type or fully automatic watering type which shall not require any operation whatever from the pump operator other than throttling the engine to the required RPM. The primer shall get automatically disengaged once the pump is registered the pressure. The primer shall be capable of lifting the water in 30 seconds from the depth of 7 meters. (upto pump inlet) at NTP condition. The reciprocating pistons shall be made up of stainless steel or Gun Metal. The cylinder and priming valve housing shall be made from gunmetal.
- 2.15 In addition Exhaust ejector type primer capable of lifting water from 7 meters within 30 seconds shall also be provided.

3 PUMP TEST:

The pump fitted on the vehicle shall be subjected to various test as detailed below

- 3.1 The pump with its all fitments will be subjected to Hydrostatic testing on a pressure of 21 Kgs./cm².
- 3.2 The pump shall be run dry for a period of minimum two minutes at 2000 RPM to check the integrity of mechanical carbon seal. After this test there shall not be any leakage of water through carbon seal.
- 3.3 The pump performance test will be carried out by running the pump at constant RPM at 2600 and measuring the discharge at various pressure.
- 3.4 The pump will be subjected to Endurance test for a period of FOUR hours continuous running. The first time hours the pump shall deliver rated out put of 2000 LPM at 7 Kg/cm² and next one hour will be 300 LPM at 35 Kg/cm².
- 3.5 During the endurance test the water shall not be replenished in the cooling system and the temperature of the cooling water and engine oil should not exceed the manufacturers standards recommendations for the continuous operation and engine should not show any sign of temperature increase.

4. POWER TAKE OFF: The P.T.O shall be Heavy duty type of suitable ratio capable of transmitting the full torque of the engine in first gear. The lever for engaging the P.T.O shall be provided in the Driver's cabin with proper locking arrangement. The PTO shall be mounted on heavy duty cross members and support brackets between the longitudinal members of the chassis frame. Means shall be provided to check the oil level in the PTO and suitable drain plug shall be provided at the bottom. A cooling coil made of copper tubes shall be provided inside the PTO at the bottom to prevent the oil of the PTO from heating.

5. WATER TANK – The capacity shall not be less than 4500 liters. The tank body and baffles shall be of minimum 5 mm thick MS plates conforming to IS 2062. The sides of the tank shall have DIE PRESSED reinforced webs for better strength and rigidity. The design of the tank should be such that the complete width of the vehicle is utilized and the height of the tank is to be kept as low as possible for better stability.

5.1. A tank of required capacity constructed out of mild steel treated for anti-corrosion shall be suitably mounted on the chassis in a manner keeping in view the proper load distribution on the axles.

5.2. A full length runner from behind the driver cabin till end of chassis frame shall be provided and made out of M.S. Channel of 100 x 50 x 5 mm suitably fixed to the chassis, frame shall be provided and

made out of M.S plate and bolted to chassis frame wherever holes are available in the chassis frame and also with 5/8" 'U' bolts and nuts shall be nylock nuts only.

5.3. The tank shall be suitably baffled with minimum 2 nos baffles fitted transversely to prevent surge when the vehicle is breaking, cornering or accelerating.

5.4. The baffles shall be arranged in a manner to facilitate the passages of a man throughout the tank for cleaning purpose.

5.5. The tank shall be mounted on minimum three cross members to counter act the stresses caused by chassis flexion and shall be so secured that it can be easily removed. The water tank shall be provided with six chairs, three on either side for mounting the tank on the runner and chassis frame.

5.6. The water tank shall be fixed to the chassis frame and runner with 'U' clamps and aluminum packing block and self-locking nuts.

5.7. Suitable eyes shall be provided on the shell of the tank to enable it to be lifted form the vehicle for repairs / replacement as and when required.

5.8. The tank shall fitted with a 50 mm bore overflow pipe. Two 63 mm instantaneous hydrant connection, incorporating a strainer with NRV, shall be provided close to the pump control panel for filling the tank through 75 mm bore pipe. Minimum 125 mm internal dia butterfly type valve. Drain valve shall be provided at the bottom of the tank.

3.3 The MS plates used for the tank shall be ZINC PLATED or galvanized and shall be given adequate anti-corrosive treatment of epoxy treatment consisting of one coat of primer with two coats of finish after preparing the surface by sand or shot blasting from inside and outside after fabrication if it is not galvanized. The open end of the overflow pipe should be taken down to a point well below the chassis without affecting the effective ground clearance when fully loaded and shall discharge away from the wheels.

3.4 Visual level gauge of the glass / acrylic tube shall be provided at the control panel calibrated ¼, ½, ¾ and full (preferably calibrated in liters).

3.5 The tank shall have a bolted manhole of 60 cm dia minimum and should have a gun metal treaded ring and gun metal cap of 30 cm dia for filling the water tank from the top. The manhole cover shall be made from 5 mm thick M.S. plate and epoxy coated from inside and outside. A cleaning hole of at least 25 cm dia shall also be provided at the bottom.

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

- (a) Hydrant – tank,
- (b) Hydrant – reel,
- (c) Tank – pump – high and low pressure hose reels,
- (d) Hydrant – pump – low pressure hose reel, and
- (e) Tank – Pump- Monitor (Foam/Water)
- (f) Off.

8. DELIVERY OUTLETS: There will be 2 Nos. delivery outlets having standard GM instantaneous .female coupling with screw type delivery valves with blank caps. It will have twist type lugs made of gun metal.

9. HIGH PRESSURE HOSE REEL: Two high pressure hose reel to facilitate operation of the high pressure section of the Fire Pump will be provided and mounted so as to be accessible for use from either side of the appliance. The hose should be prevented from kinking. The hose shall be light weight PVC nylon braided hose and the working pressure of hose will not be less than 40 Kg/cm².

The high pressure Hose reels will hold not less than 30 M of hose in one length, terminating in High pressure fog/jet trigger type gun connected by quick connect by quick connect couplings. The gun shall be made of Aluminum alloy or stainless steel (SS 304).

The inlet connection shall have a leak proof rotating type hose connector. The gun shall be of constant flow type and shall have a discharge capacity of 150 LPM approximately. Provision shall be made in the gun controls to achieve combat mode (straight jet) or a fog shield in split second. The gun shall have the ability to work on pressure for 20 Kg/cm² to 40 Kg/cm² without affecting discharge pattern. The weight of the gun assembly shall not be more than 3Kg.

10. WATER/ FOAM MONITOR: One water cum foam self aspirating type monitor will be provided on the top at suitable location, with capacity of 2000 LPM of water @ 7 Kg/cm². The

monitor will be capable of traversing through 360 degree in horizontal plane, +75° degree & -15° in vertical plane with discharge range of 70 Meters (water). The detailed specification of the Monitor is as under.

Size	75 mm
Body	Barrel of SS, GM swivel joint for horizontal & vertical Motion manual operation.
Rotation	360°
Elevation	90° (+75° -15°)

10.1 CONSTRUCTION DETAILS

Working pressure	7 Kg/cm ²
Painting	As per IS:5 (2 coats of red enamel paint)

10.2 SELF INDUCTION NOZZLE

Material of construction	Aluminium alloy to IS:617 or GM LTB Gr.2 of IS:318.
Type of Foam used	AFF Foam
Discharge capacity	2000 LPM
Throw horizontal	Water: min. 60 mtrs, Foam: min. 50 mtrs.
Foam Expansion	Min. 1:6
Fog (curtain)	160°
K Factor	100.

A suitable pick up tube of min 5 mtrs long with perforate piercing tube shall be provided alongwith the monitor.

11. PIPELINES AND VALVES:

11.1 All pipelines and pipe fittings shall be of Stainless steel (SS 304) and all valves upto 50 mm size shall be 3 piece design SS 304 ball valves. All valves above 50 mm size shall be standard butterfly valves.

11.2 all piping shall be sized so as to have minimum pressure drop and achieve the required pressure and flow at various locations.

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

11.4 The piping shall be flanged for ease of maintenance. However, flange joints shall be kept to minimum.

11.5 All lines shall be hydraulically tested at 1.5 times of the design pressure and pressure shall be held for two hours. In no case the lines shall be tested below 25 Kg/sq. cm. (g).

11.6 All lines shall be suitably supported so as to provide rigidity and avoid vibrations.

11.7 All lines less than 50 mm NB size can be socket welded to matching rating fittings.

11.8 All lines above 500 mm NB size shall be butts welded with full penetration welds.

11.9 All bolts, nuts and washers used shall be of SS-304.

11.10 COOLING STSTEM: An indirect cooling system of open circuit type heat exchanger shall be provided for cooling the radiator water & Engine. The heat exchanger tank shall be made from minimum 1.22 mm thick brass sheets and the coil in the coolant tank shall be of copper for effective cooling. The design of the heat exchanger shall be such that the temperature of the engine shall not exceed the operating temperature specified by the chassis manufacturer when the vehicle is being used in stationary conditions.

12. CONTROL PANEL

12.1 Adequately illuminated control panel shall be provided near the pump.

12.2 The control panel (s) shall include the following:

- a) Throttle control for engine;
- b) Pressure gauge – 0 to 17.5 Kgf/cm²; for low pressure (glycerin filled)
Pressure gauge – 0 to 50 Kgf/cm²; for high pressure (glycerin filled)

- c) Compound gauge (glycerin filled) calibrated as under:
 - Vacuum – 0 to 75 cm Hg, preferably in black;
 - Pressure – 0 to 15 Kgf/cm², preferably in black;
- d) Primer control for exhaust primer
- e) Temperature gauge and glow lamp for lubricating system
- f) Cooling water circuit control
- g) Water tank valve
- i) Delivery valves.
- j) Suction inlet/
- k) Hose reel valves.
- l) Water level indicator.

13. BODY WORK AND STOWAGE:

13.1 Enclosed accommodation for six persons shall be provided in the driver cab-cum-crew compartment including the driver and the in-charge of the crew. Both the seats should be independent. The driver's seat should be adjustable and comfortable. The rear compartment of driver's cabin should have one removable seat for full width of cab for 5 (five) crew members. The cab floor should be covered with 3 mm thick Aluminum chequered plate rigidly fixed to the under frame cross members by means of nuts and bolts or riveting except the mudguard arches which shall be covered with 1,60 mm Aluminum chequered plates. Trap doors for topping up oil etc wherever necessary shall provided.

13.2 One roof light should be provided in the driver's cabin dwell vision and external rear view mirrors should be fitted to the cab.

13.3 The driver cum crew cabin shall be provided with full four doors, one driver, one for officer and two at the crew compartment. The doors shall be generously sized for easy embarking / disembarking of crew members. All the doors shall be fitted on the super structural members, each hung upon three invisible coach type M.S. stout hinges and fitted with best quality handles.

13.4 The door handle on out side of driver seat shall have a locking arrangement. Other doors shall be lockable from inside. In addition to the doors locks, aluminum tower bolt shall be provided for all the doors from inside Adequate grab rails shall be provided for easily boarding and alighting from the appliance.

13.5 The windscreen glass shall be provided in the two halves and shall be semi curved type. Each glass shall be fitted in E.P.D.M. rubber beading. The glasses shall be 5 mm thick toughened safety glass.

13.6 The rubber beading used for fitting glasses and window frame shall be E.P.D.M. rubber.

13.7 The driver seat shall be adjustable type vertically, forward and backward. The officer seat shall be fixed type. Both the seats shall be rigidly fixed to the flooring by means of nuts and bolts.

13.8 The seat cushion shall be of latex foam rubber 75 mm thick upholstered in good quality foam leather cloth. The back seat shall be of latex foam rubber 50 mm thick upholstered in good quality foam leather cloth.

13.9 Below the crew seat, two lockers shall be provided One for battery box and another for keeping accessories. The extra length of battery cable if required shall be provided.

13.10 The crew seat shall be rigidly fixed to floor by means of nuts and bolts, running full width of the vehicle suitable for sitting five fireman, covered with 75 mm x 50 mm cushion latex foam rubber upholstered in good quality foam leather of approved shade.

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

13.12 The M.S runner of 100 x 50 x 5mm size shall be provided over the full length of the chassis member for the uniform distribution of load over the chassis.

13.13 Each cross members shall be secured to the chassis frame by 16 mm dia 'U' Bolts with aluminum packing block and self locking unit.

13.14 Balata packing of thickness 6 mm shall be provided in between the chassis frame and across members.

13.15 The structure / frame work shall be of welded constructions and made from 2 mm thick MS pressed sections and square tubes. The Angles and channels used shall be of min. 3 mm thickness. The complete structure material shall be treated for anti corrosion by ZINC PLATING. The plating thickness shall not be less than 20 microns. Two coats of Epoxy paint shall be applied to the completely welded structure.

The structure shall be so designed so as to avoid any vibration / ratting / deformation in the intended usage of the vehicle.

13.16 The details of super structure are as follows:

- | | | |
|-------------------------------|---|------------------------|
| a) Under frame cross members | : | 100 x 50 x 5 mm (Min.) |
| b) Floor longitudinal members | : | 50 x 50 x 6 mm (Min) |

The cab and lockers should be of composite construction with sufficient rigidity and reinforcement and shall be kept as light as possible.

The interior paneling shall be done from 1.22 mm thick aluminum sheets & the exterior paneling shall be done from 1.60 mm thick aluminum sheets.

The roof on the cabin of the vehicle shall be covered with min 1.60 mm thick aluminum chequered plates. All the lockers sides & complete rear of the vehicle shall be covered with min. 1.22 mm thick aluminium chequered plates. The complete rear deck and all lockers floors and the rear foot boards shall be covered with minimum 3 mm thick aluminum chequered plate.

Sufficient number of Lockers with suitable shelves, partitions and roll in roll out type drawers / trays shall be provided on both sides of the vehicle for secure stowage of all equipments and accessories. One thorough locker shall be provided immediately behind the drivers cab. All space available below the chassis frame level shall be utilized by providing lockers with proper doors. These doors shall be fitted with suitable chains and hooks on both sides so that the same can be used as foot board.

All lockers shall be provided with internal automatic lighting arrangement with the master switch in the cab.

All lockers above chassis floor shall be covered with Aluminum roller shutters. The roller shutters shall be made from extruded aluminum sections with suitable roller, spring, guide channels etc. All aluminum 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 should 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 should have a sturdy lock, preventing accidental opening during movement of vehicle.

Roller shutters shall be made of hollow rectangular shaped aluminum links which shall be inter connected with rubber / plastic/ PVC profiles sealing the roller shutter watertight when closed. These roller shutters should be durable, maintenance free, weather and corrosion resistant.

Suitable storage space shall be provided to store four 2.5-m lengths of suction hoses with couplings at convenient location.

SPECIAL PROVISION FOR STOWAGE OF EQUIPMENTS: For all hose fittings like branch pipes etc. quick release type couplings are 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 items damage the internal paneling & thereby increase the life of the vehicle. Suitable clamps, brackets, holders etc. are provided for all other items.

14. MISCELLANEOUS

- a) A suitable bumper shall be provided at the rear rigidly fixed to the super structural members by means of nuts and bolts which is supplied alongwith the chassis
- b) Two cat ladders made out of S.S. round or square pipe of 25 mm dia shall be provided.
- c) 2 nos of 25 mm dia aluminum pipe railing with sufficient number of aluminum double socket brackets shall be provided to the rear body over the deck.
- d) A heavy duty Towing hook shall be provided and fitted the rear bumper by means of nuts and bolts.
- e) Quick removable type wire mesh guard made form 25 x 25mm size MS wire mesh of 1.60 mm covered in MS angle frame shall be provided to all glasses of driver-cum-crew cabin.
- f) CABLE WINCH: An electrically operated cable winch of not less than 6.5 tons pulling capacity (single layer) shall be provided. The winch unit should be complete with minimum 5.5 hp, 12v DC series wound electric reversible motor for pulling operations. The motor and solenoids shall be grounded to the battery. It shall have an automatic load holding brake system for holding the load. For free spooling the clutch design shall be easy to use type with spring loaded pull and rotate system. The gear system should be 3 stage planetary type for faster line sped and the gear reduction ratio shall not be more than 300:1 for maximum duty cycle, the rope drum shall not be of more than 8 inches dia and shall be supplied with minimum 90 ft heavy duty galvanized wire rope with replaceable self locking clevis hook and shall be mounted on the front bumper of the vehicle with suitable strong supports and a 4 way roller fairlead. Weather resistant clutch housing and solenoid assembly for maximum durability under any weather should be provided. Winch shall be provided with a wireless remote control mechanism for ease of operation.

g) TELESCOPE LIGHT MASTS

A Pneumatic telescope mast should be mounted on the vehicle. It should be manufactured from Anodized aluminum pipes and have a minimum of 115 mm diameter on its base for stability. The temperature range shall be from -25 deg. C up to 60 deg. C, with anti-twist lock, with safety valve and drainage outlet valve.

The telescopic mast should be extremely strong and designed with a minimum of 5 sections with internal spiraled Electrical cable. Each section of the mast should have a water drainage outlet. The maximum height of the mast when deployed should be minimum 6000 mm (from the ground). The retracted height should be of maximum 1750 mm.

The Light mast will have 4 x 1000 Watt Halogen flood light projectors in weather proof casing. The floodlight on the top should have a minimum electrical rotation of 355° and a tilt of 350°. The fully extended mast shall be capable of withstanding wind speed of min. 120 Km/hr/

Suitable connections for taking permanent Power Supply from generator set through an internal spiral wire mounted inside the mast should be provided. Each halogen light should have the possibilities to be switched independently through individual switches.

All the functions of the mast, including extension and return to the original position, lights on/off, automatic restore should be capable of being done through a wire remote control. An additional remote control without cable (wireless) should be provided. The lamps shall be provided in a weather proof box with top cover which will be extended alongwith the lamps when in use. A 5 KVA portable Petrol engine operated GENSET shall be given to the light mast.

15. ELETRICAL SYSTEM:

15.1 All the important electrical circuit shall have separated fuses suitably indicated and shall be grouped into a common fuse box located at an accessible position. The wiring shall be single pole with negative earth.

15.2 The suitable size wire shall be selected for different circuits considering the current consumption for that circuit.

15.3 Electrical siren of 1.6 Km range 12/24 volts D.C. shall be provided and fitted at suitable place with two controlling push buttons on one officer side and another at Driver side.

15.4 Two rotating beacon lights with Amber lens shall be provided over the top of driver's cabin.

15.5 The other light, pump cabin light, locker lights shall be approved make.

15.6 All the controlling switches of lights on dashboard shall be approved make.

15.7 Two fog lamps of approved make shall be provided and fitted on front-bumper with controlling switch on dashboard.

15.8 New wiper motor assembly of 17 watts with new blades and arms shall be provided if not provided with the chassis. The locations of wiper motor shall be such that it shall be easily accessible for repairs.

15.9 Adjustable search light assembly shall be provided at a convenient position on the top of rear body deck with 30 mtrs Cable drum with Rexene cover.

15.10 Hooter cum P.A. system shall be provided with s speaker mounted on the top of Driver's cabin with Rexene cover. The output shall be 25 watts.

15.11 Adjustable spot light, mounted in a convenient position to give flood or beam of light at the rear of driver cabin shall be provided.

16. PAINTING:

16.1 The complete structure material shall be treated for anti corrosion by ZINC PLATING. The plating thickness shall not be less than 20 microns. Two coats of Epoxy paints shall be applied to the completely welded structure.

16.2 The complete external and internal aluminum paneling of driver cum crew cabin and rear body shall be painted with two coats of Zinc Chromate paint.

16.3 The complete exterior of the vehicle shall be painted with two finish coats of "POST OFFICE RED" polyurethane paint manufactured by ICI Dulux / Nerolac / Dupont.

16.4 The internal painting of cabin lockers etc. shall be done with two coats of Grey Synthetic enamel paint made by ICI Dulux / Nerolac / Dupont.

16.5 The name of the fire service / organization shall be painted on both sides of vehicle in letter of suitable size in golden yellow paint with black colour shading.

16.6 The "EMBLEM" of the department shall be painted on both sides of vehicle in natural colours at suitable place.

17. LADDAR WITH GALLOWS:

An aluminum extension ladder of Trussed type 10.5 mtrs in length shall be provided with the vehicle and mounted on suitable ladder gallows.

The design of the gallows shall be such that the ladder can be released without difficulty from a reasonably accessible position. Means shall be provided for locking the ladder when stowed.

18. B.A. SET BRACKETS:

B.A. set brackets for fixing with its fitments shall be provided just behind the crew seat. The mounting of B.A. set bracket shall be such that, it can allow fireman to wear B.A set while vehicle is approaching to fire call. Proper padding and harnessing arrangement shall be made in the bracket to avoid damages to the critical parts of the B.A. set.

19. ACCESSORIES:

The following accessories shall be provided.

19.1 Fire Bell: (Bell Carillon) : One Gun metal fire bells of 250 mm size confirming to IS 1928 of 1984 shall be mounted externally on the top of crew compartment and shall be operated within the crew compartment by firemen is seating position.

- a) Suction Hose 4" dia X 10 ft. length - 4 lengths fitted with threaded couplings.
- b) RR Delivery Hose 63 mm dia (2 ½ ")
22.5 m in length 10 lengths each
- b) Metal strainer 4 inch dia (100 mm) 1 No.
- c) Basket strainer 1 No.
- d) Suction wrenches 1 pair.

Tool Box with Tools for running repairs:

- a) D.E. spanners, 6mm to 26mm- 1 (one) set of 12 pieces
- b) Screw drivers 12" - 1 No.
- c) Combination pliers 8" 1 No.
- d) Jack with handle 1 No.
- e) Wheel wrench 1 No.
- d) Slide wrench 12" 1 No.
- e) Electric siren (Heavy Duty 'KHERAJ' MAKE) . - 1 No.
- f) Powerful fog lamps fitted with 55 watts Halogen bulbs. - 2 Nos.
- g) Powerful reversing light with 25 watts Halogen bulb. - 1 No.
- h) Revolving amber coloured blinker lights (like VIP lights) - 2 Nos.
mounted on each side on top of the driver's cabin.
- i) Inspection lamp - 1 No.
- j) P. A. System in Driver's Cabin - 1 No.
- k) Six aluminum hooks for keeping the uniform clothing shall be provided in crew compartment.

20. WIRELESS SET BOX:

Box made from 2 mm gauge aluminum sheet with lid shall be provided just behind the officer seat with 13 mm wooden plank for fitting the wireless set bracket. The design and mounting will be shown at the time of fabrication work.

21. WORKMANSHIP & FINISH: The GVW of appliance will not cross the GVW of chassis manufacturer's specification with all equipments & Crew. The entire appliance will be painted fire red on the outside. The service letter will be written on both-side "MEGHALAYA FIRE & EMERGENCY SERVICE". with yellow colour. Before final painting of Fire Tender two coats of anti corrosion and primer coat will be applied.

The appliance will clearly have the following markings at suitable locations.

Manufacturer name and Trade mark

Engine and Chassis No.

Pump No. and capacity of the pump.

Capacity of water tank, Foam tank

All instruments control will be identified with nameplates

22. ACCEPTANCE TESTS: The following acceptance test will be given to the complete satisfaction of the user. The design of vehicle will be such that it will not affect the Chassis Characteristic as specified by the chassis manufacturer such as speed, turning circle, acceleration, braking distance etc.

The stability of the appliance will be such that when under fully equipped & laden condition, if the surface on which the appliance stands is tilted to either side, the point at which over turning occurs is not passed at an angle of 27° from horizontal. This test should be carried out at the vendor factory in front of all the inspecting officers.

- i) The pump with its all fitments will be subjected to Hydrostatic testing on a pressure of 21 Kgs./cm²

- ii) The pump shall be run by dry for a period of minimum tow minutes at 2000 RPM to check the integrity of mechanical carbon seal. After this test there shall not be any leakage of water through carbon seal.
- iii) The pump will be subjected to Endurance test for period of FOUR hours continuous running. The first Three hours the pump shall deliver rated out put of 2000 LPM at 8 Kg/cm² and next one hour will be 300 LPM at 35 Kg/cm².
- iv) During the endurance test the water shall not be replenished in the cooling system and the temperature of the cooling water and engine oil should not exceed the manufacturers standards recommendations for the continuous operation and engine should not show any sign of stresses.
- v) The other tests shall be as per detailed performance parameters given for chassis, superstructure, fire fighting system which include monitor out put & throw, foam induction & expansion, load etc. Accessories shall also be subjected to relevant tests as per the specification indicated above.

TECHNICAL SPECIFICATION FOR MINI WATER TENDER BASED ON WATER MIST TECHNOLOGY TO BE FABRICATED ON A SMALL COMMERCIAL PICK UP TYPE VEHICLE HAVING A PAYLOAD OF MINIMUM ONE TON CAPACITY.

- 1.1 The specification covers the requirements of design, manufacture, testing, supply of MINI WATER TENDER BASED ON WATER MIST TECHNOLOGY – 350 LTRS CAPACITY mounted on a prime mover 207 DI Pick up Chassis which will be supplied by the department.

Water Mist Fire Fighting System

The water mist fire fighting system shall have a filling volume of 300 liters of Water and 50 liters of Foam. (total 350 liters maximum) It should be designed to be mounted on most standard pickups and other small vehicles. It should have minimal requirements of space and weight while optimizing on manpower requirement and minimizing the water and other collateral damage to negligible in comparison to conventional water tender. The Unit design shall incorporate foam induction system which provides variable foam dosing and suction of water from an external source for direct fire fighting or filling of the tank.

Specification/Details of the Unit.

Weight of empty 300 liters. Unit.....	<150 kgs. (Max)
Max. Measurements of the unit (in mm).....	As compact as possible
Useable Water capacity.....	300 liters.
Useable Foam capacity.....	50 liters
No. of deliveries.....	2 Nos

Main Extinguishing Gun

Flow rate.....	22 liters/min (+-5%)
Weight of extinguisher gun.....	2 kgs Max.
Gun Dimensions.....	As compact as possible.
Working pressure on the nozzle:.....	100 bars Max. with nominal reaction.
Throw	Jet - not less than 15 meters. (+/-10%) Spray: not less than 6 m (+/- 10%)
Hose reel.....	60 meters (standard) on manual drum
Max.set operating pressure.....	100 bars
Starter.....	Electric starter with provision of Pull cord over – ride
Level Indicator.....	Mechanical

3. **Main Pump**

The pump should be capable of suction of water from tank or open source and to maintain adequate discharge rate and pressure for operation of nozzle at optimum efficiency

Max. Pressure.....	100 Bars
Min. flow.....	38l/mn
Power of the engine.....	Not less than 13 BHP
Fuel.....	Unleaded Petrol

4. **ENGINE**

The prime mover for pump shall be 4-stroke Petrol driven engine and shall have compatible electrical and lubrication system. The engine should preferably be on 12V battery for which adequate charger shall also be provided. Suitable electronic instruments shall be provided on the body of engine / panel for fuel level, battery and temperature.

5. **Foam Induction**

A suitable means shall be provided for induction of foam from tank so that proportion for single or double delivery remains constant and foam quality is maintained.

Size of foam tank -50 liters (Min). (included in the water tank and rested from the water tank which will remain with 300 liters)

Max. induction - 6 % (From 0,5 to 6 adjustable)

6. **Accessories**

Electric starter (Enabling the Unit to be Electrically started) 1

Additional hose length of 30 meters. with drum

Aqueous film forming foam (AFFF) 50 liters filled in the foam tank and 50 liters spare)
- Tool K Comprising of 1 no adjustable spanner 12” , 1 no. cutting pliers, 1 set of flat spanners, 1 set of adjustable screw driver, 1 set of suction key and other special tools as per the requirement of the unit.

8. DESIGN & DEVELOPMENT:

8.1 Equipment details

8.2 The Water Mist Fire Fighting System will be a self driven fire fighting unit operated with in built Petrol Engine coupled to a pump and attached with a reducer & hose pipes, Mist generating Guns.

8.3 The water mist system shall be capable of carrying 300 liters **of water** and Foam tank of 50 made of GRP shape T (in order to reduce the gravity centre of the vehicle) and for AFFF a separate system to pump and mix the required ratio, which can be discharged in the form of a mist from a gun.

8.4 The discharge gun shall be of light weight having stainless steel nozzle capable of producing Water Mist with the ability to control the discharge in short burst and long shots.

8.5 The size of mist particle shall be in the range of 150 to 300 microns.

8.6 A suitable pressure reducer with a safety valve, capable of reducing to a low pressure not more than 100 bars & jerk free working pressure shall be incorporated.

The main vessel shall be corrosion free.

8.7 The foam required shall be aqueous film forming foam (AFFF).

8.8 The unit shall have adequate provisions for safety of the system.

9. SAFETY DEVICES

9.1 The following safety devices shall form part of equipment.

I) The system shall be provided with pressure safety valve.

II) The system will have proper heat & exhaust outlet for the engine without causing any interference to the operator while operating the unit.

III) Any other safety device which is felt to be necessary to be a part of the equipment.

11. MAIN WATER TANK

11.1 The water tank shall be made of GRP giving a free corrosion for life and a light weight of the WATER MIST SYSTEM, having usable water storage capacity of 350 liters (300 for water and 50 liters capacity for foam) properly baffled into segments to reduce water surge. The water tank shall be T shape and thickness of the water tank should of 5 mm Minimum. a Manhole of 330 mm avec overflow pipe and an optical level of water should be part of the tank. The tank should resist to the flame and be anti ignition complying with the international standards.

12. GUN

The Gun shall be provided with a suitable stainless steel filter. The discharge rate of main gun shall not be less than 20 liters per minute at pressure not exceeding 100 bars. The second gun should have a flow rate not exceeding 20 LPM. The designed of the gun shall such that there is no appreciable recoil pressure and the throw shall not be less than 15 meters (Jet mode) and shall not be less than 6 meters (Spray mode). The second gun shall have an attachment for discharging foam with suitable aeration facility.

13. HOSES

The hoses provided in the system shall be high quality and shall be capable of holding the temperature ranges from – 20 degree to + 55 degree centigrade. The material specification, working pressure, test pressure and cracking pressure should be indicated for each type of hoses. The minimum length of each hose should be 60 meters.

The seals and O rings use in the system should be of synthetic material like nitrite rubber or equivalent

14. MARKING

Marking shall gave details of capacity, manufacturers name, month/ year of manufacturing of the system etc
