

PECIFICATION FOR FABRICATION AND SUPPLY OF WATER TENDER TYPE-B

1. SCOPE

This standard lays down the requirement regarding design, material, construction, workmanship, finish, accessories and acceptance test of water tender. The specifications are drawn in line with technical specification of fire tender "Type - B" as per BIS - 950 - 2012. BIS/EN-1028 standards for centrifugal fire pumps are considered for the supply of water tenders of this type. Pump should be of 2000 LPM at the rate of normal pressure of 10 Kg/cm². Specifications are designed for optimum utilization of the fire engine to facilitate as a composite unit.

2. General:

The fabrication of water tender shall be carried out on a chassis of capacity – not less than 18 ton in weight (4 x 2 wheel drive); minimum 180 BHP – BS VI emission norms chassis which shall be procured by the tenderer at their cost. The appliance shall have water tank capable of carrying 5500 litres of water and shall be fitted with a pump at the rear of appliance and driven through the PTO.

3. Chassis:

Manufacturer	: Ashok Leyland / TATA / Eicher / Mahindra / Bharat Benz
GVW	: Not less than 18 tons
Engine horse power	: Not less than 180 BHP
Wheel base	: Not less than 4750 mm
Emission norms	: BS-VI
Steering	: Power steering

4. Pump:

The pump should be certified with EN - 1028, pump of normal pressure - centrifugal type capable of delivering 2000 LPM @ 10 Kg/cm² at normal pressure. The complete pump assembly and impeller shall be made of gun metal. The pump housing shall have provision to connect normal pressure hose reel & cooling water line. The pump shall be provided with suction inlet of 100 mm dia. for connecting standard suction hoses with internal removable strainer and blank cap. The pump shall be provided with two delivery outlets of 63 mm quick release coupling with blank caps. A suitable size GI pipe shall be provided between pump to monitor with proper flange connections. The pump shall be mounted at rear side of the appliance and shall be convenient to operate with the provision of all gauges & control panel as specified in the EN 1028 specification. Pump shall be of Godiva / firefly / Allied / Rosenbauer make or of any equivalent make with EN 1028 certification.

The pump shall be mounted at the rear of the vehicle connected to PTO by propeller shaft with proper rubber bed and bearing supports. The length of the propeller shaft should be minimum and balanced dynamically to overcome the problem of sagging in the event of throttling.

The impeller of the pump shall be dynamically balanced. The pump shall have self-adjusting mechanical carbon seal. The pump shall have an inbuilt filter of removable type. The filter made of stainless steel "V" wire mesh and shall have self draining facility while the pump operating. The pump shall have inbuilt pressure release valve (PRV) which operates automatically. The thermal relief valve (TRV) shall be fitted with the

pump, which helps to control the temperature with 42 degree centigrade of pump water when both deliveries are shutoff for long time. The pump shall be modular in design and shall have no gaskets/ packing. The arrangement shall be such that while carrying out the pump maintenance work, none of the discharge piping has to be removed unless required and the pump impellers and the carbon seal can be attended/ removed without removing the pump body. The pump shall be having one suction inlet of 100 mm having round threads confirming to BIS 902 and two No. of 63 mm delivery outlets having screw down type valves fitted with instantaneous couplings as per BIS 903. The delivery valve screw shall have no gland.

4.1. Primer:

Water ring type primer shall have capable of lifting water at least from 7 m depth with in 30 second shall be provided. The primer shall have to engage and disengage automatically whenever necessary. Throttle control lever shall be fixed at the rear end of the appliance. It shall be connected to engine throttle with proper cable. The cable shall be a non-stuck type for smooth acceleration and deceleration of engine.

5. WATER MONITOR:

One water self-aspirating monitor shall be provided on the top at suitable location with capacity of about 1800 LPM @ 7 Kg/cm². The monitor will be capable of traversing through 360° in horizontal plane, +75° & -15° in vertical plane with discharge range of 45 m. The detailed specification of the monitor is as under.

Size : 63mm

Body : Barrel of SS, Gun metal swivel joint for horizontal & vertical motion manual operation.

Rotation : 360°

Elevation : 90° (+75° & -15°)

Mode : Jet / Spray

6. POWER TAKE OFF UNIT

The PTO shall be of heavy-duty capable of transmitting the full power of the engine to the pump. The performance and ratio (not less than 1:1.40) of PTO unit shall match the engine & pump torque characteristics. A separate lever in the main cabin shall engage PTO. Necessary support for PTO units, propeller shaft couplings, universal joints etc. shall be provided. PTO shall be of VAS Engineering /Firefly / Webstar / Hale / Bezares India make or any equivalent make. PTO should get engaged and disengaged by an engaging lever which shall be provided in the driver's cabin. A locking arrangement shall be provided to prevent auto movement of the lever at the time of vehicle movement. The mechanical arrangement shall be through a push pull type of lever which shall ensure smooth movements for PTO to engage and disengage. A pump hour meter shall be provided in the driver cabin.

6.1. MOUNTING OF POWER TAKE OFF

Split shaft power take off shall be mounted at a suitable location on the chassis. The power take off shall be mounted on a three point type foundation using rubber / flexible mounts to isolate the PTO vibrations from the chassis and shall be designed to carry the unit weight and torque reactions, to constrain the PTO so as not to move significantly out of position, to allow chassis flexion. In no case welding/drilling shall be allowed on the chassis while mounting the PTO. Suitable sized U bolts may however be used for this purpose. The PTO alignment shall be in line with the existing drive line as far as possible. The new propeller shafts

shall be free from welds and a spline and yoke arrangement shall be used. A general layout drawing of the PTO mounting shall be enclosed with the technical offer. All the propeller shafts on the throughput side as well as at the pump drive side must be balanced to suitable standards.

7. WATER TANK

A Water Tank shall be installed on the water tender. The tank has the following parameters:

Capacity of water	5500 Litres
Material of construction	SS-304
Bottom plate thickness	5 mm
Side Plate Thickness(Die pressed stiffened on Two sides)	5 mm
Top plate thickness	5 mm
Baffles thickness	4 mm
Numbers of man holes	2
Size of the man hole	450 mm

The water tank shall be designed to carry approximately 5500 litres of water. The water tanks shall be so installed as to allow the full flow of water to the pump. The tank shall have baffle plates in order to avoid surging when the vehicle is braking, accelerating and cornering. An inspection manhole shall be provided on top of the tank. The manhole shall have a hinged cover so that the manhole shall also act as a filling orifice. Manhole shall be facilitated to seal the water leakage due to surging. Water railings shall be fixed in the sides of the water tank to conduit the water spilling.

7.1. Water tank mounting

The water tank shall be mounted on the vehicle on a sub-frame using rubber metacones. This sub-frame shall be made from anti-corrosive treated MS channel section and shall be bolted with the chassis using the high tensile bolts. 'U' Bolts shall not be used for mounting of tanks on vehicle. The rubber metacones 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 metacones and sub-frame including the load calculations and metacones quantity sufficiency.

Tank shall be mounted on the chassis in a manner keeping in view the proper load distribution on the axles. The baffles shall be arranged in a manner to facilitate easy cleaning of the tanks. The tank shall be mounted on three cross bearers to counteract stresses caused by chassis flexing. The centre of gravity shall be maintained as low as possible. Inlet piping lines shall be fixed from tank to pump with proper flange connections. Flange connections shall be made on every bends for easy removal and refitting of pipes in case of any maintenance. There shall not be any welding joints in the pipe lines instead of making flange joints. A stainless steel ON/OFF ball valve shall be fixed in the bottom of the tank so that no need to drain the water from tank in the event of repairing on pipe lines & pump. A quick action shut off valve shall be fixed in the suction inlet side of the pump. Flange joints shall be connected with SS bolts.

Suitable eyes shall be provided on the shell of the tank to enable it to be lifted off the vehicle for repairs when required. A cleaning hole shall be provided at the bottom of the tank. It shall be fitted with a drain pipe & valve which shall be taken down to a point well below the chassis

without reducing the effective ground clearance. The tank shall be fitted with an overflow pipe taken down to a point well below the chassis that discharges the water away from the wheels. Hydrant connection incorporating a strainer shall be provided for filling the tank.

8. BODY WORK/ STOWAGE/ CABIN

Enclosed accommodation with a single compartment for six persons with driver and officer in the front and a crew at the rear shall be provided. The driver seat shall be of adjustable type. The design of the cab shall be such that it affords maximum possible vision. Two hinged doors shall be provided on each side of the appliance for easy access to driver and crew. All doors shall open outward and hung forward. The locking arrangement shall be with double catch striking plate. Non-slip step and grab rails shall be provided to assist the driver and crew to get in and out. All the seats shall be fitted with 100 mm thick foam cushion. All windows shall have safety glasses and all glasses be fitted with a sliding type. Inside the crew cabin, lockers shall be given to keep helmets and provision shall be made permanently to hold two number of BA sets so as to wear it easily. Flooring of the driver cum crew cabin shall be fabricated out of hard dip galvanized MS angles of 40 x 40 x 4 mm thick which shall be properly welded / bolted to the cross members. The complete external paneling of driver-cum-crew cabin including doors shall be of 16 SWG Aluminium sheet with all the joints riveted and bided except the roof top paneling, which shall be of 2 mm thick aluminium sheet. The domes and the corners shall be as small as possible and shall be of 16 SWG Aluminium sheet with all joints riveted to the super structural members. The roof top plates shall be overlapped by 70 mm and riveted in a double row with solid rivets. The complete flooring of the driver-cum-crew cabin shall be fabricated from 3.15 mm aluminium

chequered plates rigidly fixed to the under frame cross members by means of nuts and bolts or riveting. Trap doors for topping up of oils wherever necessary shall be provided. Water proofing treatment shall be given to driver's cabin to avoid water leakage inside the driver's cabin.

All the hard dip galvanized super structural members and under frame cross members shall be painted with three coats of rust preventive paint. All the under frame cross members shall be painted with two coats of chassis black paint. The construction of cab shall be such that the roof shall support the weight of two men without damage. A horizontal hand rail shall be fixed in front of the crew member's seat. The hand rails shall be connected with vertical post of the cabin. Access way to driver shall be provided in between the vertical post. Inspection / maintenance hatch of removable type shall be provided in the cabin for gaining access to gear box / PTO.

Each cross member shall be secured to the chassis framed by "U" clamps with aluminium packing block and self-locking nut. Ballato packing of 12 mm thickness shall be provided in between the chassis and cross members. Drag hooks/eyes shall be fitted on each chassis member at front and rear and one towing hitch shall be provided at the rear portion for towing one ton trailer.

The lockers shall be composite construction with sufficient rigidity reinforcement and to be kept as light in weight as possible. The entire structure shall be made of 32x32x1.6 mm square tube of GI 16 gauge aluminum sheet and it shall be used for exterior paneling work all over. For inner wall of the lockers, 16 gauge galvanized iron sheets shall be used. 2.5 mm thick aluminum checker plate shall be used for locker floor.

There shall be two lockers, one on either side of the chassis at the suitable side for stowage, in addition to this, a through & through locker

shall be fabricated at front side of the appliance. The lockers shall be composite construction. Non-stuck aluminium shutter doors shall be provided for all lockers. The shutters shall be complying with international standards. The inner walls of the lockers shall be of 16-gauge GI and 3 mm thick aluminum checker plate for flooring. All lockers shall be weather proof and self-draining type. All lockers shall be provided with internal automatic lighting arrangement with the master switch in the cab. Provisions shall be given to hold and secure the equipments in the lockers so as to avoid damage of such things while movement of the vehicle. The suction hose tunnel shall be provided at suitable location for carrying four numbers of 5 m long, 100 mm diameter suction hose. Standard Brass bell shall be fitted over the crew cabin. See through glass window provision shall be given in driver and officer side door bottom. The MS channels, angles and tubes wherever used for construction shall be treated with hard dip galvanizing. Certificate shall be given by the vendor.

9. Ladder gallows:

Ladder gallows shall be provided for carrying 10.5 m aluminum extension ladder. The design shall be such that the ladder can be released without difficulty from reasonable access position and shall embody rollers/bearing to permit easy withdrawal by one man. Means shall also be provided for locking the ladders when stored. The ladder gallows shall be CE certified.

10. Alternator unit:

A 230/230 V. 50 Hz portable electric start superior quality diesel engine driven Generator shall be provided. The generator shall be screen protected, continuously rated, self excited, self regulating class "E" insulation type having an output of not less than 6.5 KVA, 230 V single

phase. The alternator shall be equipped with a direct coupled flange mounted exciter which shall keep the alternator voltage constant and provide an approximately straight line voltage characteristic within 5 percent at all loads, and at a pre-set factor between 0.8 and unity.

Necessary monitoring systems such as voltage, amperage, engine temperature, oil pressure shall be a part of the Genset. Required output plugs with MCB control shall be given in the Genset for safety.

11. Telescopic light mast

A compact, roof mounted folding type lighting mast fitted with 4 x 100 watts water proof LED lamps shall be fitted rear side of the vehicle. The mast shall be elevated and vertically be extended up to 4.5 m pneumatically from the roof top. The mast shall be installed on the roof of the vehicle. The light mast shall operate in temperatures of - 40°C up to 60° C, with anti-twist lock, with safety valve and drainage outlet valve. The mast will be equipped with a spiraled electrical cable. The folded and stowed height should not be more than 1800 mm. The flood lights on the top should have a minimum electrical rotation of 360° and a tilt of 310° with suitable connections for taking permanent power supply from generator set through an internal spiral wire mounted inside the mast should be provided.

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 wired remote control. The same remote control must work without wire (wireless mode) through a male / female connector IP68 which keeps the battery under charge, whenever the remote is plugged and there is tension on the power circuit. Every single input given by the user, no matter which, will be confirmed by a visual LED and an additional LED will confirm the battery status. Every single

group of 2 lights when switched on will have a corresponding LED alight on the remote control that will go off only when the lights will be switched off. Every single input given by the user on the remote control will make the whole remote keyboard alight for not less than 15 seconds. A metal canopy shall be provided to safeguard the light mast. Canopy door shall be provided with safety cutoff switch to prevent the light mast working automatically in door closed position.

12. Cable winch

An electrically operated cable winch which is having not less than 6.5 ton pulling capacity shall be provided. The winch unit should be complete with minimum 5.5 hp, 12/24 v DC series wound electric reversible motor for pulling operations. The motor and solenoid shall be grounded to the battery. It shall have an automatic load holding brake system to hold the load. For free spooling the clutch design shall be easy to use type with spring loaded pull and rotate system. The gear system shall be 3 stage planetary type for faster line speed 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 diameter and shall be supplied with a minimum of 90 ft heavy duty galvanized EIPS 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 four 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 system for ease of operation.

13. Control panel:

The following control shall be provided at the rear pump operating panel.

- a) Pressure Gauge: 0 to 40 kg/cm²

- b) Compound Gauge calibrated as
 - i) Pressure 0 to 10 kg/cm² (in black)
 - ii) Vacuum 0 to 75cm Hg (in red)
- c) Engine throttle control
- d) Pump hour meter in dash board.
- e) Audio warning arrangements at pump panel for engine temperature exceeding 90°.
- f) LED light on control panel
- g) Tank water level indicator (LED Indicator and Glass tube level indicator with drain valve)
- h) Cooling water circuit control.

The gauges panel shall be covered properly to prevent the gauges getting damaged from sunlight and rain water.

14. Workmanship and finish

All parts of the appliance shall be of good workmanship and shall have streamline finish. All mechanical and other part shall be such that parts normally required to be replaced can be supplied and fit correctly.

15. Painting

The complete super structural members shall be painted with two coats of Red-Oxide primer and two coats of chassis Grey paint. The complete external and internal aluminium panelling of lockers etc. shall be painted with two coats of aluminium primer. To provide very high corrosive resistance in metal structures, it shall be treated with anti-corrosive treatment.

The complete exterior of the vehicle shall be painted with two finish coats of RAL-3000 colour shade (flame red) reputed brand paint for long lasting glossiness. The names and logos of the department shall be

painted on both sides of vehicle at suitable places in consultation with the department officers.

16. Pump test:

PRIMING TEST: The primer shall be tested with a vertical lift of 7.0 m. The rate at which the priming is done shall not be less than 30 cm/sec. Pump test when tested in accordance with pump specification, the efficiency shall not deviate from the value specified by the pump manufacturer by more than ± 5 percent. However in no case the efficiency of the pump shall be less than 60 percent. The pump shall run for a period of 4 h non-stop delivering the rated output at 10 bar with a lift of 3 m. During the test, the water shall not be replenished for the cooling system and the temperature of the engine oil shall not exceed 115°C or of the engine manufacturer rated temperature for continuous working, whichever is less.

The engine shall show no sign of stress during the test. The temperature of the cooling water (radiator water) tank shall not exceed 85°C. The PTO sump oil temperature shall not exceed 100 percent of the manufacturers recommended temperature for the grade of oil used. The pump casing and impeller shall be subjected to hydraulic pressure of 2.1 MPa to detect leakage, perforation, etc.

17. Warning beacon lights:

1 No of flickering LED Beacon bar light head of Red, Blue and White colour with Hooter & P. A. System shall be mounted on top of the driver cabin. The size of the beacon bar light shall not be less than L-1200 x W-300 x H-120 MM. 2 no Dual Red-White and 2 no Dual Blue-White Scene-Lighting LED blinkers with inbuilt flasher shall be installed on each sides of the body. 2no of blue-red combination flickering lights shall be fitted in the radiator grill. Two big square size (blue-1 No& Red-1 No)

flickering light shall be fitted in rear side of the appliance. The blinkers shall have an option of minimum 12 watt spot lighting along with blinking for low light visibility. Blinkers and Beacons shall have minimum 6 no of flash patterns. Blinkers and Beacon shall have Aluminium Base with Polycarbonate Cover. The lights shall be SAE Certified from NABL approved authorities.

18. Accessories:

The following accessories shall be provided in addition to those normally fitted on modern commercial vehicles:

- a) Fire bells — 250 mm diameter brass fire bell shall be mounted externally and shall be capable of being operated from within the driving compartment. The bell shall be of the hand operated type.
- b) Head lamps — Two.
- c) Fog lamps — Four (Not less than 55 W).
- d) Reversing light with industrial truck buzzer— Lamp suitably situated to assist reversing.
- e) Stone guards — Situated on the windshield glass and side window glasses
- f) Wind screen wipers.
- g) Siren — Battery operated. BIS 950: 2012.
- h) Search light — Adjustable to give flood or beam light, mounted in a convenient position but capable of being readily disconnected and mounted on a tripod away from the appliance, complete with tripod and with not less than 30 m of TRS cable on a reel mounted on the appliance.
- i) Spot light — Adjustable, mounted in a convenient position on the near side of the driving compartment.

- j) Inspection lamp — protected type on wander lead with plug. A socket shall be provided in the control panel in the driver's cab for plugging in the lamp.
- k) Tail lamps — Two of combined stop and tail.
- l) Rear reflectors.
- M) 3M Reflector tapes (Red colour for rear side, Amber colour for both sides and white colour for front side).
- n) Reverse camera with screen in dashboard

19. MARKING

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

- a) Manufacturer's name, or trade-mark, if any;
- b) Serial number of the pump body and year of construction;
- c) Capacity of pump, in l/min;
- d) Capacity of water tank, in litre;
- e) Nominal speed, in rev/min;
- f) Transmission ratio of the pump gear;
- g) Working pressure, in kg/cm²;
- h) Direction of rotation of the pump shall be indicated by an arrow and this shall be permanently marked on the pump body.
- i) Weight of the appliance in both laden and unladen condition

20. Test of Acceptance of Fire Fighting System

Physical dimensions, performance and weight check of equipment as given under different items above shall form part of test of acceptance. The appliance shall be inspected in different stages before mounting of the complete unit to the chassis and after mounting of the complete unit on to the chassis. Stage inspections will be carried

out from the department during each stage of fabrication. All necessary arrangements shall be arranged by the supplier at the fabrication yard for the proper conduct of such inspections as and when required by the department.

Inspection will be as under:-

- a) Finishing inspection.
- b) Compliance of specification
- c) Pump Endurance Testing
- d) Complete functions-operations of all systems

The stability of the appliance shall be such that when under fully equipped and loaded condition (but excluding crew),if the surface on which the appliance stand is tilted to either side, the point at which over-turning occurs is not passed at an angle of 27 degrees from the horizontal. Vehicles shall be tested for articulation (200 mm alternate gradients & will not show any signs of stress during this test. Also the clearances in the wheel wells shall be checked for tolerances. Water proofing shower test shall be confirm to IS 11865 and gradient test.

21. RTO REGISTRATION

Final RTO registration of the vehicle in the name of 'Director, Tamil Nadu Fire and Rescue Services, Chennai' shall be arranged by the supplier after the vehicle is delivered at the headquarters. The vendor shall bear all registration related fees and expenses of completed vehicle and submit all relevant documents to department after registration.

22. WARRANTY

The Superstructure, pump, PTO, tank and other construction shall be under warranty for a period of minimum five years from the

date of supply of the vehicle against any manufacturing defects. The supplier shall give the guarantee for the supply of spare parts for the super structure, fire pump, PTO etc. for the period of 15 years from the date of supply of vehicle.

23. COMMISSIONING AND TRAINING

The manufacturer's representative shall impart successful commissioning and the training to the fire brigade personnel regarding operation, handling, use and maintenance of the appliance. Operating manual shall be given along with each vehicle in both tamil and English language.

List of equipments and tools to be supplied along with each vehicle

S. No	Items	Qty
1	Suction hose 100 mm dia 5 mtrs	02
2	Metal strainer	01
3	Basket strainer	02
4	Universal suction hose wrench	02
5	Dividing breaching(Gun metal)	01
6	collecting breaching(Gun metal)	01
7	Snake catcher – 6ft length	01
8	Petrol Driven Power Saw Bar length: 24inch, Power: Not less than 85 cc, two stroke. Maximum power speed: 9600 RPM, Weight; not more than 8 kg, spare chain:1, tool kit-1	01
9	100 ft long 16 mm diameter BOB rope	01
10	40 ft length 12 mm diameter BOB lashing lines	02
11	Spades with wooden handle basket size 200 x 290 mm	02
12	D handle Shovel Total length : 25 inch Basket length: 8.3 inch Basket width : 6.1 inch	01
13	Lock cutter (Weight - 4 kg, Dimensions LxWxH - 79x24.8x 4.4 cm)	01
14	Firemen axe 2.25 kg	01
15	Pick axe standard size	01
16	Picks, with handle standard size	01
17	Axes, felling standard size	01
18	Crow bars, 1 m long	01

19	Sledge hammer 10 kg	01
20	Electrical shock proof hand gloves in pairs. A) Made as per confirming to IS 4770/ EN 60903 / ASTM 120 D type 4 B) Approved from ERDA – Electrical Research & Development Association C) Accredited by the NABL, Govt. of India & INTERTEK (ASTA), UK. D) Working Voltage: 17000 volts (RMS). Test certificate of gloves shall be supplied during delivery.	01
21	Shears, bolt cropper, large with handle, 900 mm	02
22	Extension truss type aluminum Ladder 10.5 m as per IS: 4571 & CE standard, the ladder OEM serial number & manufacturing year shall be mentioned in the supplied ladder. [King / AJAX / simplex]. Tipping Type Ladder gallows shall be provided on the roof suitable for fixing a 10.5 m heavy duty trussed aluminium extension ladder. The design shall be such that the ladder can be released by one person only without difficulty from a reasonably accessible position and the person is not required to climb on the roof top to remove the ladder. The ladder gallows shall be CE certified. The bidder shall mention the name of OEM of offered ladder and its gallows with the offer	01
23	Rope Ladder (10 M)	01
24	Portable Hand-Held LED Search Light Lumens not less than 10000	01
25	First Aid Box for 10 Persons to be suitably kept at cabin.	02
26	Long line rope [Manila rope], 25 mm circumference, and minimum breaking strength: 23 KN, 50 m long, attached with quick release karabiner at one side.	01
27	Long line rope [Manila rope], 40 mm circumference, and minimum breaking strength: 23 KN, 30 m long, attached with quick release karabiner at one side.	02
28	Fire hook with non-metallic hand grip	02
29	Fire beater with non-metallic hand grip	02
30	Fire rack with non metallic hand grip	02
31	Fire resistant blanket - Aluminized fire blanket made of aluminized fiberglass, stitched on all four side with Kevlar thread, Leather loops & eyelets, temperature resistant up to	02

	>500 degrees, With Metallic eyelets in all side corner and in middle and Size – 2 x 2 M.	
32	Fire resistant blanket non-asbestos high temperature resistant fabric with metallic eyelets, non-asbestos clothing, stitched on all four sides with flame proof threads, temperature resistant up to >600 degrees, With metallic eyelets in all side corner and in middle, 1.2 mm thick,Size – 2 x 2 M.	02
33	Temperature resistant tight fight hand gloves, made of Kevlar material	02
34	Tool Kit box with the following tools: Fixed end "D/E" spanner set (size from 6mm to 30mm): 02 Sets Ring spanner set (size from 6mm to 32mm) : 02 Sets Box spanner (Tubular spanner) Size: 8-10mm,10-12mm,12-14mm,14-16 mm: 02 No each. Combination cutting pliers (Size: >150 mm): 2 no pliers: 2 no Screw driver set insulated (long screw driver, short screw driver, star screw driver – 3 no each) Tool box (Suitable to carry all above tools)- 2 no Oil can medium size: 2 no	01
35	Demolition hammer 1900W with min 60 joules impact energy(Reputed make like Bosch or equivalent)	01
36	Safety goggles	01
37	Safety Harness (IS 3521 :1999) DESIGN - One dorsal attachment D-ring for fall arrest, Adjustable leg straps. Adjustable chest straps, Sit Strap, Made up of elastic webbing for more comfort & impact resistant. WEBBING –Material: Polyester, Width: 44±1mm, Breaking strength: 23 KN STITCHING THREAD - High-tenacity polyester. METAL COMPONENTS – Material: Aluminium, Plating: Black anodized, Finish: Matt. VITAL TEST COMPLIANCE - Static Strength: 15 kN or 1,530 kgf for 3 Minutes at each attachment element, WEIGHT - 1006 gm ±10 gm	02

38	Spine board stretcher Length in 1840 mm with tolerance ± 5 mm, Width in 450mm with tolerance ± 5 mm, Weight should not more than 6.5 kg, Loading capacity should be 200 kgs, Number of Pins 14 -16	01
39	Mattocks standard size	02
40	Mega phone battery operated(Reputed make like Ahuja or equivalent)	01
41	Fire Extinguisher (Stored Pressure DCP - 9Kg, 4.5Kg - Co2, 9Liters Stored Pressure Foam)	03
42	Life Buoy IS:5326	
	Material	PVC
	Color	Orange
	Inner Diameter	40 cm
	Outer Diameter	85 cm
	Shape	Round
	Usage	Swimming
	Pattern	Plain
43	Life Jacket 2mm Neoprene life vest (Reputed make like Aropec or any equivalent)	06
44	Traffic Cone	10
45	Cordon tape	100 mtr