PRE-QUALIFICATION CRITERIA:

FABRICATION AND SUPPLY OF 70M HEIGHT HYDRAULIC PLATFORM – AERIAL LADDER FOR FIRE FIGHTING AND RESCUE

1. The manufacturer should be ISO 9001 Certified company for design manufacturing and after sales service for Aerial Ladder Platforms and necessary certificates to be submitted with the offer.

2. Manufacturer shall have their sales & service network in India through their authorized agency / representative / distributor which shall have enough experience in Fire & Emergency Vehicles segment with full fledge manufacturing / fabricating the Fire Vehicles / tenders. To substantiate, Indian agent / representative / distributor shall furnish the authorization letter in original with tender documents.

3. i) The manufacturer must have manufactured and supplied at least 50 numbers of hydraulic platforms – aerial ladder platforms to various fire brigades or industries providing fire and rescue services globally, out of which 05 numbers must be supplied of the required or higher height.
   ii) The manufacturer must have also manufactured and supplied minimum 05 numbers hydraulic platforms – aerial ladder platforms, having height not less than 32 Meters to various fire brigades or industries providing fire and rescue services in India. (Performance certificates of at least 3 such vehicles along with purchase order to be submitted with the offer)

4. Certification / declaration regarding meeting the criteria as per EN 1777 to be submitted by the manufacturer.

5. Welding quality for load bearing steel structure for Hydraulic platform- aerial ladder platform shall be as mentioned in EN-1777 and shall be Certified / declared by the manufacturer.

Note:

1. Wherever makes of any equipment is given it shall always be read in continuation word "or equivalent"
2. Wherever the numerical is used indicating dimensions of any equipment or material, tolerance of +/- 10% shall be accepted. Except for working height and cage load.
3. Wherever the items / equipment is mentioned having NFPA or EN requirement, for all those equipment, proper certificate regarding the same shall be supplied by the OEM / Fabricator
4. In case of any deviation observed during tendering process, either by tenderer or supplier in the specification, the cognizance of the same may be taken in the pre-bid meeting by communicating the same to the authority.

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SPECIFICATIONS FOR FABRICATION AND SUPPLY OF HYDRAULIC PLATFORM OF 70 MTRS. HEIGHT FOR FIRE FIGHTING AND RESCUE

	1.			**GENERAL REQUIREMENT**:
		1.1		The Hydraulic Platform shall be designed specifically for the purpose of fire fighting and rescue to enable firemen to go up over and above the other side of any obstruction. It shall comprise of main boom with Telescopic sections and Articulated Booms with Telescopic sections and cage mounted at the end of third boom and the entire unit shall be mounted on a Turn-Table on a Heavy Duty Diesel - Engine chassis of VOLVO or MERCEDES BENZ make, having not less than four axels with minimum two in the front and two at the rear with fully factory built and furnished cabin with Crew Cabin, Right hand drive and suitable capacity PTO. If factory built crew cabin is not available manufacturer shall provide bench type crew seat suitable for 04 fireman's fitted behind the drivers cabin, properly upholstered and provided with safety belts with provision for protection from weather condition. The Vehicle Chassis shall comply BS VI (EURO 6), OBD II emission norms or as per latest norms.
		1.2		The Hydraulic Platform shall be designed as per the designed, operational stability and structural strength based on the criteria laid in EN 1777 or equivalent norms and standards applicable for elevated raised platforms used for Fire Fighting and rescue operations.
		1.3		The Hydraulic Platform shall be capable of use at angle of 85 degrees of the first boom without any reduction of load capacity of the cage. It shall also rotate 360 degree when the 1st boom has been raised to the required working position as well as below ground level subject to boom remaining clear of vehicle body and or any obstruction.
		1.4		The appliance shall be fast on the road and easily maneuverable. The overall dimensions shall not exceed the limits specified herein.
		1.5		The working height of the Hydraulic Platform shall not be less than 70 mtrs from the Ground and the Horizontal outreach shall not be less than 32 mtrs. with 130 kg cage load and 28 mtrs with 500 kg cage load. (no further tolerance accepted)
		1.6		The Hydraulic Platform shall be electro hydraulically controlled, permitting precise and easy operations under the most difficult conditions, with ample reserve strength and stability.
		1.7		Full safety interlocks shall be incorporated in the design so as to ensure complete safety in operations and long years of reliable and trouble free service.
		1.8		The design of the platform shall allow a very large safety margin for extreme operating and climatic conditions. The safe working loads

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				ratings shall include an allowance for the weight of water system and the reaction from the monitor jet while operation.
		1.9		The Vehicle shall have a leveling system to adjust axial and transverse movement to an angle not less than 5 degree and it shall be in automatic in nature.
		1.10		There shall be a full back up system for all boom movements and outrigger movement in case of failure of main system.
		1.11		The Complete Movement of the platform shall be computer controlled and the system shall be tested as per EN 1777 or relevant standards.
		1.12		The Control system of the platform shall be fully tropicalised and able to operate in the temperature range upto + 50 degree centigrade and in a dusty and Humid condition without reducing the maximum operating limits.
	2.			**CHASSIS:**
		2.1		The Chassis shall be of VOLVO or MERCEDES BENZ make, 10x4 or 8X4, having suitable Wheel Base with fully factory built and furnished cabin and suitable capacity PTO. The Vehicle Chassis shall be a Right Hand Drive and shall comply BS VI (Euro 6) as per Indian norms at the time of registration or as amended from time to time.
		2.2		The chassis shall be homologated from the appropriate authority in India.
		2.3		The engine shall be minimum six cylinder, inline, Diesel with direct injection, turbo charged with inter cooler.
		2.4		The engine shall develop minimum 400 HP.
		2.5		The gearbox shall be semi/fully Automatic with suitable Power Take Off to drive the hydraulic pump and Fire Pump.
		2.6		Rear Axle shall be Tandem Bogie type with Hub reduction and differential lock between the wheels and axles along with Tag axles.
		2.7		Chassis frame shall be 'C' Channel section made of high strength steel with cross members.
		2.8		The Steering shall be integral power steering with collapsible steering wheel and column.
		2.9		The Front Suspension shall be leaf spring type and rear shall be combination of leaf spring and air suspension.
		2.10		The Brakes shall be dual circuit air brakes with parking brakes acting on rear wheels.
		2.11		Fuel Tank - Capacity shall be min 300 ltrs with lockable fuel cap.
		2.12		The Chassis shall be provided with Radial tyres of suitable size as per load on axles with spare tyre.
		2.13		The chassis shall be provided with single day type cab with RED colour, made from high strength steel fully trimmed, external panels hot dip galvanised with hydraulic cab tilting mechanism. The Cab suspension shall be provided with coil spring and shock absorber. The

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				cab shall be provided with adequate ventilation, rear view mirrors, windscreen and windows, adjustable driver seat, wiper system and along with all other standard fitments.		
		2.14		The Electrical system shall be 24V, with suitable capacity batteries & Alternator for charging the batteries.		
		2.15		The chassis shall be supplied with standard tool kit, hydraulic jack, operator & workshop manuals.		
		2.16		The Chassis shall be fitted with suitable capacity Power Take Off Unit to drive the hydraulic pump for boom movements and Fire pump.		
		2.17		The Chassis shall be directly procured by the tenderer confirming to above specifications and shall be got homologated with the concern RTO in India. The Transportation responsibility of the chassis up to tenderers manufacturing facility lies with the tenderer.		
		2.18		The Chassis shall comply all the provisions and enactment of Motor Vehicle Act 1988 and Central Motor Vehicle Rules 1989 and any amendment from time to time.		
	3.			**OPERATING REQUIREMENTS & DIMENSIONS OF FINISHED APPLIANCE :**		
				The Vehicle shall comply the following requirements		
		3.1		Working Height	:	70 mtrs min.
		3.2		Height to working cage bottom	:	68 mtrs min.
		3.3		Min Working Outreach 500 kg Min Working outreach 130 kg	:	Not less than 28 mtrs Not less than 32 mtrs
		3.4		Working outreach with at all heights from ground level to 30 m above ground level, min 500kg cage load	:	Not less than 21 mtrs
		3.5		Working reach below ground level	:	6.0 mtrs. Approx.
		3.6		Rotation - Continuous	:	360 degree
		3.7		Safe working load in the cage on hard level Ground with dry monitor	:	500 Kg Minimum
		3.8		Safe working load with monitor in the cage Delivery upto 3800 LPM	:	360 Kg Minimum
		3.9		Loading capacity of lifting eye under the Cage (cage empty)	:	500 Kg Minimum
		3.10		Operations at maximum outreach with Full working load permitted in wind speed upto	:	12.0Mtr/Sec. min.
		3.11		Operating time at full stroke for all operations	:	As per standards
		3.12		Overall length in traveling position	:	13.0 mtrs max
		3.13		Overall width of the vehicle	:	2.55 mtrs max
		3.14		Overall Height in traveling position	:	4.0 mtrs max

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		3.15		Maximum width of the vehicle when Jacks are fully extended on both sides	:	8.00 mtrs max.
		3.16		Gross Vehicle Weight	:	43.5 ton max for 5 axle (10 x 4 chassis) 40 Ton max for 4 axle (8 x 4 chassis)
	4.			**CONSTRUCTION:**		
				The appliance shall be robust in construction; materials used in construction shall be carefully selected for lightness and durability. Use of timber shall be restricted in bodywork and use of rubber shall be avoided as far as possible. Ferrous metal parts shall be treated for anti - corrosion by a method other than electro-plating.	
	5.			**BOOMS:**		
		5.1		The vehicle shall perform the following functions/ operations		
			5.1.1	Elevation		
			5.1.2	Depression		
			5.1.3	Extension & housing of telescopic sections		
			5.1.4	Rotation 360 degree in either direction		
		5.2		All the operations shall be electro-hydraulically operated with the help of hydraulic cylinders, wire ropes, chain etc. The system shall be purpose built to provide smooth takeoff, variable speed range and smooth slowdown, based on the criteria laid down under EN 1777 or any other relevant standards applicable for these kind of vehicles.		
		5.3		There shall be two booms, both with telescopic extension providing direct movement, first boom movement of 85 degrees, and the second boom additionally with vertical movement of approx. 180 degrees. This configuration shall achieve compact travelling dimensions yet in extreme versatility in operation. The second boom should provide an up-and-over capability of approx. 11 m throughout its vertical and horizontal movement		
		5.4		The booms shall be box/ trapezoidal section type, welded construction; welding method shall be of latest technology (preferably Plasma welding) to provide high durability and extreme accuracy. For high strength and minimum flexing of the boom sections only high tensile strength steels shall be used for load bearing structure.		
		5.5		The Welding quality for load bearing steel structure for Hydraulic platform- aerial ladder platform shall be as mentioned in EN-1777 and shall be Certified / declared by the manufacturer.		
		5.6		The main boom elevation and lowering shall be controlled by two hydraulic cylinders that both have their separate safety devices and can alone carry the entire load in case of failure of any one of the cylinders.		

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		5.7		All telescopic sections of the first boom shall move in a synchronized way and there shall not be any intermediate jerks during extension / retraction. Automatic slowdown mechanism at the beginning of the movement as well as end of the movement shall be provided to all boom movements. All the moving sections shall be fitted with adjustable guides/ rollers to provide smooth and accurate movement. Various maintenance points shall be located well at hand either outside the boom or behind easily removable covers.
		5.8		All booms shall be internally and externally primed and painted for long life span, treated against rust and corrosion.
	6			**HYDRAULIC CYLINDERS:**
		6.1		The Hydraulic cylinders shall be double acting, fitted with lock valves so as to prevent booms, working cage from lowering or the outriggers from retracting in case of pipe or hose failure.
		6.2		The cylinders shall be provided with automatic dampers to prevent the pressure shocks and shall dampen the movement when a mechanical stop is reached.
		6.3		Retraction of the outriggers shall be automatically prevented as soon as the booms have been lifted up from their transport position by way of electrical OR Hydraulic interlock system.
		6.4		The main boom elevation and lowering has to be controlled by two hydraulic cylinders that both have their separate safety devices and both can alone carry the entire load in case of failure of any one of the cylinders.
		6.5		The piston rods of the jack cylinders have to be fully enclosed within rectangular steel profile in order to protect piston from damage caused by any external impacts.
		6.6		Lifting of the booms from the transport position shall be prevented before the outriggers are in support position.
		6.7		All the movements shall be automatically limited in their extreme position and the working cage shall be prevented from working outside of the permitted working range in any position.
		6.8		An emergency stop switch shall be provided on both control panels, which shall switch off the hydraulic pressure of all movements and shall stop the vehicle engine. The unit shall be supplied with a manual Bleed Down System and Emergency Hydraulic Back-up System.
	7.			**TURN-TABLE:**
		7.1		The turntable shall be fully integrated steel structure containing center post, slip rings, water line, etc duly fastened to the main frame by means of slewing ring.
		7.2		The rotation for the turntable shall be controlled by hydraulic motor with brakes through oil immersed reduction unit.
		7.3		The base control station shall be attached to the turntable so as to

				rotate with it and be accessible in all positions of the turntable.
		7.4		The hydraulic distributor (center post) shall be mounted in the center of the turntable at an accessible position and shall carry the hydraulic pressure and return lines, electrical supply lines & water line allowing continuous rotation in either direction.
		7.5		The fasteners retaining turntable to the rotation mechanism shall be of proper grade and shall be torqued properly.
		7.6		The rotation gearbox fastener shall be of proper grade and torqued with proper backlash.
		7.7		There shall be provision for the manual rotation of turntable in case of failure of hydraulic system.
		7.8		Pins securing the hydraulic cylinders to boom and turntable shall be properly installed and secured.
		7.9		The hydraulic hoses, tubings and connections provided in the turntable shall be free from kinks, chaffing or leaks.
	8.			**MAIN FRAME:**
		8.1		The main frame shall be welded, preferably box section type made from high tensile steel plates and shall absorb all the stresses generated by platform and outriggers.
		8.2		The front mounting bolts of the mainframe shall be spring loaded to allow the chassis frame to flex when the outriggers are fully down to avoid any stress concentration on the chassis frame.
		8.3		The main frame shall incorporate hydraulic oil tank, outrigger beam housing, and it shall be bolted to the chassis frame and the slew ring support plate shall be welded to the top of the main frame and shall be precision machined.
		8.4		The main frame is fixed onto the chassis frame with bolts in such a way that chassis performance and durability are maintained.
	9			**STABILISING / JACKING SYSTEM:**
		9.1		The Jacking system shall consist of hydraulically operated four outriggers mounted in their housings in the main frame. Each housing shall be fitted with adjustable guides to provide smooth and accurate movement of the outrigger beam. The outrigger piston rods shall be completely protected by closed steel profile.
		9.2		The Jacks shall be telescopic H-type or Y-type or X-type construction, each outrigger shall have two separate hydraulic cylinders, the first of which pushes the horizontal outrigger beam out and the second shall push the vertical / inclined Jack down.
		9.3		The jack shall be provided with ground pressure sensors, which shall be correctly actuated before the booms are operated to ensure proper

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				stabilization.
		9.4		Each Vertical jack shall be provided with self-aligning footplate to spread the load evenly and allow the operation on uneven ground.
		9.5		The Jacking shall be able to level the vehicle up to 7 degree sideways and fore and aft with automatic leveling system. There shall be manual override system.
		9.6		The automatic jacking system shall be controlled preferably by hand held remote control box provided with back lit push buttons for following operations.
			9.6.1	Left side outrigger beam out.
			9.6.2	Right side outrigger beam out.
			9.6.3	Automatic leveling
			9.6.4	Outrigger back to transport position
		9.7		The Jacking systems shall allow operating each jack individually and the jack projection shall be recognized by the controlling system.
		9.8		The jacks shall be controlled individually or in pair with levers / push buttons and the control panel shall be situated in such a position that, the operator will have clear look to the right and left hand side while extending the jacks. The control panel shall be located at the rear side of the vehicle.
		9.9		Yellow Flashing warning lights shall be provided at the outer most point of the jacks to identify the position of the jacks during night operation.
		9.10		Four wooden spreader plates shall be provided for the use, when the vehicle is to be operated on soft ground.
		9.11		The Vehicle shall be provided with Digital inclinometer which will measure both fore, aft and Sideways inclination of the vehicle up to minimum 5 degree.
		9.12		The Jacking system shall also have automatic "ONE BUTTON" jacking system with two independent automatically operating and self-controlling safety system to prevent an unsafe configuration.
		9.13		The stabilizing system shall also incorporate axle-locking mechanism if required.
		9.14		The Jacking / stabilizing system controlling box shall be located in such a way that it allows operator to see outrigger at all times preferably remote control box with wonder lead containing the push buttons for automatic jacking.
		9.15		The available outreach to all directions must be shown on the outrigger display, before the outriggers are extended. This is to save time in an emergency situation, giving the operator the possibility to see the available outreach before setting up the machine.
		9.16		The transversal and longitudinal angles of the chassis have to be shown on the display numerically before the outriggers are extended giving the operator the possibility to see whether the leveling capacity of

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				the machine is sufficient without adding extra packing underneath the outriggers.
		9.17		In addition, the following controls shall be provided on jack control panel:
			9.17.1	Starting of chassis engine
			9.17.2	Stopping of chassis engine
			9.17.3	Activating the outrigger controls
			9.17.4	Outrigger and outreach display with faultfinding system
			9.17.5	Operating hour and rpm-up gauge in the display.
			9.17.6	Switch for the battery driven back up for the hydraulic system
			9.17.7	Visual indications for leveling of the vehicle (fore, aft & sideways)
			9.17.8	Emergency stop
			9.17.9	Controls for the automatic jacking
			9.17.10	Engine start / stop button for diesel engine of standby system.
		9.18		The locker containing outrigger controls shall be fitted with an automatically operating door switch and a light for night operation.
	10			**ELECTRONIC SAFETY AND OUTREACH SYSTEM**:
		10.1		The computer-controlled system shall allow to select the working cage load according to working situation, based on calculations and parameters saved in the system to guarantee exactly the same outreach regardless of the external influences like wind speed and direction, temperature, friction of the cylinders, etc.
		10.2		The display units of the system shall show maximum possible outreach and position of the working cage in real-time along with other details.
		10.3		The electronic system shall be approved according to the valid standards and directives as amended from time to time. The system shall be EMC tested (EU directive 89/336/EEC) and CE type tested by TUV or any other appropriate agency.
	11.			**CAGE:**
		11.1		The working cage shall be fixed to the boom with proper pivoting point preferably about one meter above the cage floor to provide highest possible degree of natural safety.
		11.2		The cage shall be made of tubular steel / Aluminum / stainless steel profile, welded together and painted with special paint with high durability. The dimensions of the working cage shall be approx. 2.2 m (length) x 1.15 m (width) x 1.10 m (height) and it shall be fitted with an inward opening door located at suitable place to enable safe access to the cage. The top railing shall be part of the cage door so that entering into the cage without bending is possible. The rescue entrance shall be located in the front and top railing is formed for safe and easy access.
		11.3		The cage shall be designed for 500Kg working load and shall be tested

				to 1.5 times the working load.
		11.4		The cage load can be changed from display unit and the selection of load can be possible from turntable and cage control center. The chosen cage load can be displayed by clear symbols and numerically in selected format on all display units. The selected cage load shall be shown preferably by graphic bar.
		11.5		When the load selection is made at turn table or cage the system shall automatically show the maximum outreach to all directions with selected cage load and outrigger position.
		11.6		The control panel in the cage shall be fitted in such a way that the operator shall see the booms clearly at all the times.
		11.7		The cage shall be kept horizontally leveled in any position of the booms. An automatic hydraulic device shall control the leveling system with fully automatic and independent safety circuit in case of an uncontrolled leveling failure. There shall be a master switch for the automatic leveling system, so that it can be isolated and then manually controlled system activated.
		11.8		The working cage shall have capability to turn minimum 45 degrees to each side from its center position. The movement shall be powered hydraulically with controls in the working cage and at the turntable control panels. The center position of the cage is indicated by a visual indication at both control panels.
		11.9		At the front of the working cage there shall be a drop down rescue platform with automatically operating safety railing to provide additional safety during rescue and fire fighting. The dimensions of the rescue platform shall be approx. 1.36 m x 0.5 m with minimum 180Kg load carrying capacity.
	12			**HYDRAULIC SYSTEM:**
		12.1		The Hydraulic power shall be provided by a reliable and adequate capacity variable displacement double axial piston pump, which shall be driven by the vehicle power take off.
		12.2		When no operation of the aerial device is activated, the pump shall rotate on minimum flow and minimum pressure. When one of the movements is operated the control valve automatically increases the pressure to a pre-set constant level and the oil flow to the amount that is needed for the movements activated. The flow of the pump shall be sufficient to give the supply of Hydraulic oil at required pressure to all the movements activated simultaneously at full stroke without affecting the preset speed.
		12.3		There shall be a provision of instant couplings for attachment of manometer in each pressure line for checking pressure of each circuit.
		12.4		The filtration system of the hydraulic oil shall consist of suction strainer in the suction line, pressure filters in each pressure circuit, return filter in return line and air filter on the reservoir. All the pressure filters shall

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				have blockage indicator.
		12.5		All hydraulic cylinders shall be double acting with hard chrome plated piston rods and shall be fastened by means of self-aligning ball bearings to prevent lateral forces from damaging the seals or piston rods of the cylinders.
		12.6		Hydraulic oil tank shall be integrated or fitted into the main frame and shall have a proper heat dissipation system. The tank shall be fitted with oil level gauge, temperature gauge, and suction connections with closing valves for easy maintenance and draining outlet with closing valve.
		12.7		The hydraulic oil cooler shall be provided and fitted at suitable place with electric fan controlled automatically depending upon the temp. of hydraulic oil. The design of the oil cooler shall be such that the temp. of hydraulic oil shall remain within manufacturer's limit when platform is being used continuously.
	13.			**BACK-UP FOR THE HYDRAULIC SYSTEM:**
		13.1		There shall be a separate diesel engine of HATZ make or any equivalent make (silent pack) mounted at suitable place, preferably in one of the lockers driving the hydraulic pump, which will provide independent means of hydraulic power in case of failure of main engine of vehicle. The Diesel engine shall have sufficient power to drive all the movements of the booms but at a reduced speed. The Engine shall be able to start from all control panels.
		13.2		In addition to the above, there shall be battery driven Hydraulic pump, which provides independent means of hydraulic power in case of failure of main engine and standby engine of vehicle. The battery pump can be operated from all control panels.
	14.			**CONTROLS AND SAFETY:**
		14.1		The Electrical supply needed for control system shall be taken from the vehicle battery which shall be charged when the engine is running.
		14.2		When the vehicle is in operation yellow flashing warning lights mounted on the outriggers shall automatically remain on.
		14.3		The engine starting and stopping switch shall be provided on all control panels and the engine speed shall be increased to the preset level as soon as any one of the control lever or dead man pedal is operated.
		14.4		All boom and rotation movements shall be controlled electro-hydraulically by means of proportional valves. The proportional valve shall not be sensitive to changes of ambient or oil temperature, and shall provide smooth, safe and very accurate movements even in most severe operating conditions.

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		14.5		The speed of the first boom for lowering and extension shall be automatically reduced at maximum outreach. The first boom lifting speed shall be reduced before the maximum elevation.
		14.6		All control movements can be performed by the control system from both control panels and the outreach can be selected by the positioning the outriggers. The variable system shall consist two displays, the graphical display and real time information about the outreach and the cage position and also to show possible movements according to cage position.
		14.7		Signal lamps shall be provided for following functions:
			14.7.1	For the outriggers, in transport position in driver's cab
			14.7.2	For the outriggers working position on all control panels
			14.7.3	For the P.T.O. engaged in the driver's cab
			14.7.4	For the transport position of the booms in driver's cab
			14.7.5	For the middle position of the rotation on the turntable and cage control panel.
			14.7.6	For the exceeding of the safe working load in the cage on the turn- table and cage control panels.
	15.			**TURNTABLE AND CAGE CONTROL PANELS:**
		15.1		The turntable control panel incorporating all control levers and safety system indicators shall be fitted with a rotatable arm (preferably) at the side of the turntable. The control panel shall be placed and locked conveniently in its operating position to provide the operator with an excellent view over the different indications of the safety systems.
		15.2		The control panel can be rotated and locked in a position enabling direct access from the decking of the vehicle into control station.
		15.3		The control station shall be fitted with convenient adjustable seat to provide comfort even in case of prolonged operation. The platform underneath the control position shall be covered by non-slip aluminium plate.
		15.4		The control panels at turn table and cage shall be exactly alike which will reduce the risk of confusion amongst operators under stress or even panic. Both the control panels shall be provided with weather protection covers/ box.
		15.5		The turntable control panel shall have a change over switch to select the control station from which the operation is performed.
		15.6		Both control panels shall be fitted with following warning, indication, control devices, and shall be marked by clear symbols for easy recognition.
			15.6.1	visual and audible indication for exceeding safe working load
			15.6.2	visual warning for activation of working cage collision guard system
			15.6.3	visual indication for ground pressure of the outriggers

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			15.6.4	visual indication for the center position of the booms
			15.6.5	visual indication for the center position of the working cage
			15.6.6	starting and stopping of chassis engine
			15.6.7	switch for the operating battery driven pump for hydraulic back-up system
			15.6.8	Starting and stopping switch for standby diesel engine for hydraulic back-up system
			15.6.9	Joystick control levers for each movement
			15.6.10	push button / joystick for cage slewing
			15.6.11	emergency stop button
			15.6.12	overriding of the automatic working cage leveling system
			15.6.13	manual operation for the working cage leveling system
			15.6.14	switch for activating the bleed down system near the turn table control panel.
	16.			**CONTROLS AND INDICATORS IN DRIVERS CAB:**
		16.1		The following control and indicators shall be provided in drivers cabin.
			16.1.1	Visual warning for outriggers in traveling position
			16.1.2	Visual warning for any of the equipment lockers being open
			16.1.3	Visual warning for the booms not being fully in transportation position
			16.1.4	Switch with visual indication for rotating beacons
			16.1.5	Switch with visual indication for siren unit
			16.1.6	Microphone for the public address system.
	17.			**SAFETY DEVICES:**
		17.1		All the hydraulic cylinders shall be fitted with lock valves directly integrated into the cylinder structure to prevent the booms, the working cage or the outriggers from retracting in case of a pipe or hose failure.
		17.2		Retracting of any of the outriggers shall be automatically prevented as soon as the booms have been lifted from their traveling position. Similarly lifting of the booms from the traveling position shall be prevented until the outriggers have reached the ground pressure.
		17.3		The leveling system of the vehicle shall give audible warning at cage & ground level if permitted inclination increases due to changing ground conditions
		17.4		All boom movements shall be limited at their most extreme positions making it impossible for the operator to reach an unsafe configuration by normal means of operation. The movements having direct influence on the stability of the vehicle shall be fitted with two separate limiting circuits, the first one retarding and stopping that particular movement, and the second one deactivating the whole electric and hydraulic system shall the first circuit fail.

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		17.5		All major movements such as lifting of the first boom to its maximum elevation, and extending the telescopic movement of the 1st and 2nd boom or moving the 2nd boom at the maximum outreach shall be fitted with slow-down devices to provide smooth deceleration, and starting of the movement shall also be retarded for smooth acceleration.
		17.6		An overload warning system shall be fitted to give and audible and visual warning in case of exceeding the safe working load in the cage and at the same time boom movements are slowed down and outward boom movements shall be stopped.
		17.7		A cage collision guard shall be provided and shall be integrated to cage load sensor to provide additional safety when operating in darkness or in dense smoke. The system shall stop all movements.
		17.8		An emergency stop button shall be provided on both control panels to provide immediate and complete "freezing" of all systems in case of an unexpected emergency.
		17.9		All the control levers shall be "Dead Man" type and shall automatically come to zero position when released.
		17.10		There shall be a "bleed down" system, which can be operated from turntable to lower the booms and bring the working cage down onto the ground even if no hydraulic pressure and electric is available with rotation mechanism.
		17.11		When one of the outriggers has not enough ground pressure, the system shall give an audible and a visual alarm. If two outriggers loose ground contact, unsafe boom movements shall be stopped.
		17.12		The safety system shall bring the working cage automatically to center position while lowering the boom in transport position.
		17.13		The vehicle shall be equipped with electrical sensors for temperature and pressure of the Hydraulic oil. The temperature and pressure shall be shown on every display unit.
		17.14		The vehicle shall be fitted with tilt alarm to give audible & visual alarm on display if the vehicle is leveled incorrectly. The tilt alarm angle shall be adjustable.
		17.15		The system of the vehicle shall be based on clear and easy to understand symbols. If texts are used on master screens, the operator shall be able to change the language in use. All measure units of master screens shall be changeable to locally used format by operator.
		17.16		The wind speed sensor shall be fixed in the working cage. The wind speed shall be shown on every display unit. When wind speed is higher than allowed the system shall give audible and visual alarm. The wind speed meter shall not limit the use of the platform.
	18			**BODY WORK AND EQUIPMENT LOCKERS:**
		18.1		The structure for the bodywork shall be made up of various Aluminium / stainless steel profiles properly fixed together by riveting, bolting or welding.

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		18.2		The complete external paneling of the rear body shall be made from Aluminium sheet fitted to the structural member either by gluing or riveting.
		18.3		The complete flooring of the rear deck shall be made from nonskid aluminium chequered plate properly riveted or bolted to the superstructure members.
		18.4		For the easy access to the rear deck from ground level, there shall be sufficient number of recessed steps on both sides of the vehicle provided with suitable grab handles.
		18.5		Sufficient numbers of lockers shall be provided on both side of the vehicle for keeping various accessories and equipment. The locker shall be so made that load distribution on both sides is equal. All the lockers shall be provided with rolling shutters properly sealed for water and dust ingress. All the doors of the lockers shall be fitted with automatic switches activating the light as soon as the door is opened and also activating the warning light in Drivers cab.
	19			**THE WATER SYSTEM:**
		19.1		The waterway shall be completely made of stainless steel / Aluminum. The nominal diameter of the water way shall be minimum 100 mm. There shall be one 2 ½" (63 mm) male inlet (as per BS standard) with a closing ball valve at each side at the rear of the vehicle from where the water line leads through the center post in the turntable up into the working cage where the water monitor is mounted. The telescopic water pipe shall be provided on the side of booms properly supported and protected with flexible pressure hose on the boom knuckles.
		19.2		The water line shall be protected from possible over pressure by means of relief valves mounted underneath of the turntable.
		19.3		A Telescopic water pipe shall be provided on the side of the booms, which shall be made of stainless steel/ Aluminum. Moving sections of this pipe shall be externally ground & chromium plated for long life. Seals between the sections are of low friction type and can be easily tightened if so required. On the other booms a fixed stainless steel pipe shall be installed and at the boom pivoting points, flexible and specially reinforced pressure hose shall be used. All hoses shall be fixed to the pipe with reliable span-lock connections.
		19.4		An additional outlet of 63mm (as per BS standard) with female coupling and closing ball valve shall be provided to the water piping in the cage. There shall be drain cocks fitted in the piping to enable to drain the water from the piping after use.
		19.5		On the front side of the cage underneath, a nozzle shall be provided for water spray curtain system to protect the cage occupants from radiant heat. Control valve of water spray curtain system shall be located inside the cage.

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		19.6		There shall be hose reel mounted on the side of the cage with 20 m X 1" dia hose with Fog/Jet nozzle. The hose reel shall be provided all the valves and fittings in the cage.
	20			**FIRE PUMP**
		20.1		Rear mounted or Midship mounted centrifugal type fire pump having 5000 - 6000 lpm output at 10 bar made from bronze material shall be provided.
		20.2		The fire pump shall be driven by suitable PTO having adequate power and torque to meet the out put criteria of the pump.
		20.3		Pump controls shall be provided near the pump as per rear or midship mounted of the vehicle including.
			20.3.1	4 x 63 mm delivery outlets (2 on each side) as per BS standards.
			20.3.2	1 x 6" suction inlets (1 on each side) as per BS standards.
			20.3.3	4" line going to the work cage.
			20.3.4	pressure gauge for the pneumatic system
			20.3.5	Electric speedometer for the pump shaft
			20.3.6	Hour meter for the fire pump
			20.3.7	Pressure/vacuum gauge
			20.3.8	Pressure governor
			20.3.9	Fire pump rpm control
	21			**WATER MONITOR:**
		21.1		Water monitor shall be connected to the piping system and shall be mounted outside the cage in a suitable position so that the entire cage floor area can be fully utilized in extreme rescue situations. Monitor shall be hydraulically operated from turn table or cage control panel with manual override system.
		21.2		The monitor shall be made of light alloy and fitted with jet / fog nozzle of Akron/ TFT/ Elkart or equivalent make with maximum capacity of 3800 LPM.
		21.3		The Monitor shall have Horizontal rotational movement to left and right side And also vertical up and down movement.
		21.4		There shall be ball valve type control valve for the monitor and the monitor shall be manually operated.
	22.			**INTER COMMUNICATION SYSTEM:**
		22.1		There shall be fully transistorised talk back inter communication system fitted between turntable and the cage.
		22.2		The system shall be combined microphone and loudspeaker for hands free operation and shall be located in the cage. The turntable control station is also equipped with microphone, which shall be integrated in the loudspeaker with volume control.
		22.3		The microphone and the loudspeaker shall be sealed properly and it shall be protected from the ingress of water, dust and humidity.
		22.4		In addition to above there shall be two VHF walki Talki sets fitted in the

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				cage and on turn table of Motorola or equivalent make. The set shall be tuned to fire brigade frequency and shall be completely water proof and dust proof confirming to IP 67 standards. The licensing for this VHF sets shall be the responsibility of supplier.		
	23			**ELECTRIC SYSTEM:**		
		23.1		The electrical supply shall be taken from the vehicle batteries, which are kept charged when the engine is running. Voltage of the system shall be 24 V DC and all circuits shall be provided with specific fuses depending on the current consumption of that circuit.		
		23.2		When the main current is switched on, yellow flashing warning lights located at each outrigger and booms pivoting point and underneath of the working cage shall automatically be switched on.		
		23.3		2x 24 volts, 30watts, Xenon or equivalent lights with swivel mounting bracket shall be fitted at the cage railing in the front side to provide extra safety during night operation. The switch for these lights shall either be provided on the light itself or on both the control panels.		
		23.4		Two rotating beacon lights shall be provided on each side of the drivers cab roof with Amber colour lens. The switch for switching the beacons on and off with suitable signal light shall be integrated in the control panel of siren cum public address system.		
	24			**SIREN AND PUBLIC ADDRESS SYSTEM:**		
		24.1		There shall be an electric siren unit fitted on the roof of the vehicle cabin or at a suitable place with the control unit mounted conveniently inside the driver cabin. It shall have the fast (yelp) and slow (wail) sound modes with integrated switch for rotating beacon lights.		
		24.2		Command microphone, which is fitted with push-to-talk switch, allows the Public Address message to override the siren function. Operations is possible from drivers cabin.		
	25			**DIGITAL DISPLAY UNIT:**		
		25.1		The vehicle shall be provided with 3 full colour LCD displays situated at outrigger center, at turntable and the cage control panel.		
		25.2		The display shall have following features:		
			25.2.1	Type	:	TFT technology, transflective.
			25.2.2	Size	:	Min 6.5 inches
			25.2.3	Configuration	:	396x232 RGB pixel, full colours
			25.2.4	Push buttons	:	Multifunctional Membrane type
			25.2.5	Warning Lights	:	LED's / Lamps
			25.2.6	Backlight	:	Suitably illuminated for night operation & shall have good visibility in broad daylight.
		25.3		The display shall show the location of the fault if occurred in the system while operating the vehicle.		
		25.4		The control system of the vehicle shall have self-fault finding system. If		

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				any fault occurs during the operation, the system shall find out the same and shall show the location of the defective component on the display. The system shall incorporate simple test screens to enable testing of the working cage and the turntable control panels. The tests shall also cover display unit, push buttons, joysticks and control lamps.		
		25.5		For maintenance purposes the following tools shall be provided as standard supply:		
			25.5.1	Fault finding system and fault register		
			25.5.2	Status screens for sensors, switches, hydraulic valves, control lamps, etc.		
			25.5.3	Total operation and hour meters.		
			25.5.4	Operation and hour meter since last service		
			25.5.5	Service counters and alarm for general maintenance.		
			25.5.6	Software verification management		
			25.5.7	compatible software relevant to the system.		
	26			**FAULT FINDING SYSTEM:**		
		26.1		The control system of the vehicle shall have self-fault finding system. If any fault occurs during the operation, the system shall find out the same and shall show the location of the defective component on the display. The system shall incorporate simple test screens to enable testing of the working cage and the turntable control panels. The tests shall also cover display unit, push buttons, joysticks.		
		26.2		For maintenance purposes the following tools shall be provided as standard supply:		
			26.2.1	Fault finding system and fault register		
			26.2.2	Status screens for sensors, switches, hydraulic valves, control lamps, etc.		
			26.2.3	Total operation and hour meters.		
			26.2.4	Operation and hour meter since last service		
			26.2.5	Service counters and alarm for general maintenance		
			26.2.6	Software verification management		
	27.			**PAINTING:**		
		27.1		Before painting all surfaces of steel structures shall be carefully shot blastedafter which they shall be primed and then applied the coat of approved paint. The final paint thickness of the paint film shall not be less than 100 microns. All the booms shall also be painted from inside.		
		27.2		For very high corrosion resistance of hollow structures such as steel profiles of the working cage, booms, outrigger beams and housings shall be treated with anti- corrosion protection preferably with "TECTYL" or equivalent.		
		27.3		The following Paint shades shall be used:		
			27.3.1	Working cage & wheel rims	:	White aluminium RAL 9006

			27.3.2	Working cage support, boom Sections, Turntable and related Cylinders	:	White RAL 9010	
			27.3.3	Main frame, outriggers and Body work including cabin	:	Red RAL 3000	
			27.3.4	Chassis frame touch-ups	:	Chassis original tone	
		27.4		The word "---------- FIRE & EMERGENCY SERVICE" of concern Urban Local Bodies or Special Planning Authorities shall be painted on both side of the vehicle at suitable place as per the instructions of the Chief Fire Officer / Director, MFS.			
		27.5		The emblem of ""---------- FIRE & EMERGENCY SERVICE" of concern Urban Local Bodies or Special Planning Authorities shall be painted on both side of the vehicle in Natural colour as per the instructions of the Chief Fire Officer / Director, MFS			
	28			**ACCESSORIES:**			
		28.1		Wooden outrigger ground pads/ plates with brackets	:	4 Nos	
		28.2		Working range diagrams, at turntable & in the cage	:	2 Nos	
		28.3		Marking of safe working load in the cage	:	1 No	
		28.4		Unit type marked at the boom	:	2 Nos	
		28.5		Warning labels and instruction plates	:	1 set	
		28.6		Operation and maintenance manual for HP, Chassis, standby diesel engine	:	2 sets	
		28.7		Plug for 24 V working light at the turntable and in the working cage	:	1 No	
		28.8		Lifting hook under the working cage, capacity 500 kg	:	1 No	
		28.9		Hydraulic pressure gauge	:	2 No	
		28.10		Set of tools & accessories required for the repairs & maintenance of HP, chassis, & other systems	:	1set	
		28.11		Safety belts for cage occupants	:	5 Nos.	
		28.12		Loadman, portable device for measuring the bearing capacity of ground.	:	1 No.	
		28.13		Radio remote control for boom and water monitor Operation		1 set	
		28.14		Reversing camera on both rear sides with 6" display in cab.		1 set	
		28.15		Winch in the cage for material, 80 metres cable 300 kgs. capacity.		1 set	
		28.16		Auto pulley with harness at both rope ends for rescue 80 metres Rope and 150 kg working load capacity.		1 set	
		28.17		Xenon or equivalent work lights 24V / 100 watts with yellow glass at the cage.		2 No	
		28.18		Hydraulic pressure intensifier for hydraulic tools 720 bar.		1 set	

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		28.19		Electronic ultra sensor impact control system.		1 set
		28.20		Rotating beacon on rear deck.		2 Nos
		28.21		Return oil filters service indicator.		1 set
		28.22		Pressure guage for water pressure at monitor		1 No
		28.23		LED ultra bright blinkers on and around the cage and vehicle.		8 Nos
	29			**INSTRUCTION MANUALS:**		
		29.1		Two sets of complete instruction manual for the operation and maintenance of Hydraulic Platform unit (including all systems), stand by systems, chassis and itemised spare parts list shall be supplied along with electrical circuit diagrams, hydraulic circuit diagrams.		
		29.2		All the manuals, circuit diagrams, literature etc shall be in English language.		
	30			**DRAWINGS:**		
		30.1		The complete detailed drawings of Hydraulic Platform duly mounted on chassis specified herein shall be submitted along with the tender.		
		30.2		The working range diagram alongwith all the details shall also be submitted along with the tender.		
	31			**STABILITY:**		
				The stability of the vehicle (in traveling position) when fully equipped and loaded (excluding crew member), with hydraulic platform resting on the resting stand and without extending the stabilizing jacks shall be calculated theoretically and certificate to that effect shall be submitted along with the vehicle.		
	32			**WARRANTY:**		
		32.1		The manufacturer/ supplier shall furnish a warranty for the complete unit including chassis for period of 24 months from the date of acceptance of the vehicle at the local fire service.		
		32.2		The manufacturer shall also guarantee for the supply of spare parts & service for chassis and Hydraulic Platform including all systems for a minimum period of 10 years from the date of supply of the vehicle.		
	33			**R. T. O. REQUIREMENTS:**		
				The vehicle shall be equipped with all the accessories required for registration of the vehicle and shall conforms to Motor Vehicle Act 1988 and Central Motor Vehicle Rules, 1989 or any amendment incorporated from time to time.		
	34			**DEVIATION:**		
				Any deviation / departure from the above specification shall be pointed out separately with detailed explanation.		

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	35			**GENERAL:**
				Any additional information or clarification required can be given on application to the Chief Fire Officer or Director, MFS, as case maybe.
	36			**INSPECTION:**
		36.1		The Chief Fire Officer or Director, MFS, as case maybe and the engineer of the fire brigade department or their authorized representative will carry out the inspection and the testing of the fully built vehicle at the factory premises of the vehicle manufacturer prior to dispatch. The traveling and accommodation cost shall be included in the basic cost of the vehicle.
		36.2		It is obligatory to the supplier to provide all the assistance and equipment for the inspection and testing of the vehicle at their premises.

37. TRAINING

37.1 The successful tenderer has to arrange training for the personnel of fire brigade department in handling, operation and maintenance of the above equipment. The training of minimum 4 sessions either at Fire Station of the concern ULB's or any other suitable location mutually agreeable to Head of the Fire Service of the ULB's and the contractor. The training shall cover operation, handling and maintenance of all the tools equipment and gears listed under this tender.

37.2 All the expenses towards the training shall be included in the cost in addition to training material and the cost of tools and equipment and consumable required at the time of training. The training program shall be chalk out in consultation with Head of the Fire Service or any other officer authorized by the him.

38. COMPREHENSIVE SERVICE MAINTENANCE CONTRACT (CSMC):

38.1 Comprehensive Service Maintenance Contract period will start from the date of expiry of 24 months warranty period .

38.2 The Contractor shall offer the vehicle with three years COMPREHENSIVE SERVICE MAINTENANCE CONTRACT which includes the cost of repairing of vehicle at periodic intervals or at the time of breakdown of vehicle including the supply of original spare parts (The User may demand for separate Commercial rate of the vehicle and separate rate for CMSC for three years for better comparison purpose).

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38.3 The COMPREHENSIVE SERVICE MAINTENANCE CONTRACT shall be for superstructure as well as for the chassis. The servicing of the superstructure and the chassis shall be carried out strictly as per the manufactures recommendations at periodic intervals.

38.4 During the contract the vehicle shall be checked periodically at the interval of every three months and all the test and checks shall be carried out as per manufacturers recommendations.

38.5 The spare parts used at the time of periodical servicing shall be original and brand new.

38.6 Any break down of the vehicle shall be attended within 72 hrs. from the time of intimation of break down (telephonic / written) to the contractor.

38.7 The servicing and repairing of vehicle including chassis shall be carried out through skilled workers as certified by the manufacturer.

38.8 All the tools, consumables etc. required for the servicing of the vehicle shall be arranged by the contractor.

38.9 The Bidder / Indian representative should have the experience of servicing or certificate in this regard can be obtained from OEM that the bidder / Indian representative has the facility for servicing such HP and in event of any breakdown, the vehicle shall be repaired / serviced within 72 hrs from the lodging of the complaint / intimation to the bidder. The undertaking to that extend shall be provided by the OEM.

38.10 The complete servicing of the vehicle shall be carried out well in advance as per the provisions of Motor Vehicle Act and Central Motor Vehicle Rules when the vehicle is due for renewal of mechanical fitness certificate.

38.11 Any break down of vehicle on emergency call or on road shall be attended immediately.

38.12 The complete servicing and repairing of vehicle shall be carried out under the supervision of technical officer of department and all the instructions (oral or written) given by him time to time shall be incorporated / attended.

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38.13 Any damage to the vehicle due to in proper handling or due to accident shall be attended promptly and the cost on account of such repairs including the cost of spare parts shall be got approved from Purchaser prior to such repairs.

38.14 Any dispute arise out of this contract, Purchaser will be the final authority and the decision given by him shall be binding to both the parties.

38.15 The tenderer shall give the details of work to be carried out at periodic interval of three months along with the offer.

38.16 The contractor shall maintain the log book of the vehicle and shall enter all the details of repairs /service of the vehicle carried out time to time and same shall be got certified either from Officer in charge of the fire station or from workshop in charge.

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