



Bharat Heavy Electricals Ltd
Boiler Auxiliaries Plant

Ranipet-632 406

FLUE GAS DESULPHURISATION

TECHNICAL SPECIFICATION

SPECIFICATION NO: UPVUNL:FGD:ELEVATOR

REV NO:00

TECHNICAL SPECIFICATION OF ELEVATORS

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A) DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER:

Sl. No.	Description	Require For Part	Purpose
1.	Reference plant details of similar or higher capacity elevator supplied	I	Qualification Requirement
2.	Proforma Invoice of Supply	I	Consideration of Bid
3.	Proforma Invoice of Mandatory Spares	I	Consideration of Bid
4.	Proforma Invoice of Erection & Commissioning	I	Consideration of Bid
5.	Seal & Sign of bidder on all pages of specification	I	Technical Evaluation of Bid (TEB)
6.	Deviation List (if any)	I	TEB
7.	Machine room layout (in consultation with BHEL)	I	TEB
8.	GA of Elevator with loading data	I	TEB
9.	Filled Data Sheets of Elevator & All accessories	I	TEB
10.	T-S curve & Performance curve	I	TEB
11.	Anchor Plan & Civil foundation Loading details	I	TEB
12.	Required Electric power & other Utility List	I	TEB
13.	Schedule of Guarantee (Annexure-I)	I	TEB
14.	Make of all bought out items & sub vendor list	I	TEB
15.	Quality Plan	I	TEB
16.	List of Start-up & Commissioning Spares	I	TEB
17.	List of Special Tools	I	TEB
18.	Delivery Schedule	I	TEB
19.	Catalogue	I	TEB



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B) DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:

Sl. No.	Description	Handing over of Documents after Contract (in weeks)	Purpose
1.	GA of Elevator & accessories with bill of material with loading data (in PDF & Autocad format)	2	BHEL Approval
2.	Filled Data Sheets of Elevator & All accessories	2	BHEL Approval
3.	Anchor Plan & Civil foundation Loading details	2	BHEL Approval
4.	Machine room layout (in consultation with BHEL)	2	BHEL Approval
5.	Quality Plan with Inspection & Performance Test Procedure at site	3	BHEL Approval
6.	Motor Sizing Calculation	4	BHEL Approval
7.	T-S Curve for motor selected	4	BHEL Approval
8.	Motor Rating in Kw	4	BHEL Approval
9.	Sub vendors List	4	BHEL Approval
10.	Manufacturing Schedule	4	BHEL Approval
11.	List of Special Tools	8	E&C
12.	List of Start-up & Commissioning Spares	9	E&C
13.	Required Electric power	10	E&C
14.	Pre- Commissioning Check List	10	E&C
15.	Installation & assembly procedure	10	E&C
16.	Erection & Commissioning Shedule	10	E&C
17.	Recommended Repair Procedure	10	E&C
18.	Operation and Maintenance Manual (10 hardcopies and 5 electronic copies in English)	10	E&C
19.	Electrical Load List with Single Line Diagram	10	BHEL Review
20.	Control Logic of Elevator	10	BHEL Review
21.	Local Panel Control Circuit Diagram	10	BHEL Review
22.	Catalogue	10	BHEL Review
23.	Proforma Packing List	12	Dispatch



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1.0	INTENT OF SPECIFICATION
	This specification covers the minimum requirements for the complete design, material, manufacturing, shop inspection, performance testing at the manufacturer's works, delivery at site, and erection & commissioning of Elevators along with accessories which is to be furnished in the Flue Gas Desulphurization plant. - Bidder shall assume full unit responsibility for the entire equipment assembly and make all possible efforts to comply strictly with the requirements of this specification and other specifications/attachments to inquiry/order. - The Bidder shall offer only proven design which meets the Provenness criteria indicated in the clause no: 2.0. Necessary document evidences as per Annexure-II shall be submitted along with the bid. If bidder doesn't meet the specified provenness criteria, they are denied to participate in this tender. - In case, deviations are considered essential by the Bidder (after exhausting all possible efforts), the same shall be separately listed in Annexure-III. - No deviation or exception shall be permitted without the written approval of the purchaser. - Compliance to this specification shall not relieve the Bidder of the responsibility of furnishing equipment and accessories/auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions. - In case, the Bidder considers requirement of additional instrumentation, controls, safety devices and any other accessories/auxiliaries essential for safe and satisfactory operation of the equipment, the same shall be recommended along with reasons in a separate section and include the same in scope of supply. All accessories, items of work, though not indicated but required to make the system complete for its safe, efficient, reliable and trouble free operation and maintenance shall also be in supplier's scope unless specifically excluded.
2.0	PRE QUALIFICATION REQUIREMENT (APPLICABLE IN CASE OF OPEN TENDER)
	Bidder to have previous experience of manufacturing, supplying, erecting and commissioning the Elevators of minimum 1000 kg capacity in coal fired thermal power plants such that respective equipment(s) should have been in successful operation for a period not less than One (1) year from the date of Techno commercial bid opening. Proof of such experience have to be submitted along with the bid.
3.0	STATUTORY REQUIREMENTS
	All registration and statutory inspection fees if any, in respect of his work pursuant to this contract shall be to account of the elevator vendor. However, any registration, statutory inspection fees lawfully payable under the provision of any statutory laws and its amendments from time to time, during erection in respect of the plant equipment ultimately to be owned by owner shall be to the account of the owner. Should any such inspection or registration need to be re-arranged due to the fault of the vendor or his sub-contractor, the additional fees for such inspection and / or registration shall be borne by the vendor. While the statutory payment shall be made by the owner for any registration, statutory inspection etc. during erection, the vendor shall be responsible for carrying out and co-ordinating various activities with the statutory authority as well as for obtaining the clearance and registration of the equipment.



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4.0	REFERENCE STANDARDS		
	The Elevators shall be designed in line with the recommendation contained in the latest editions of applicable Indian Standards. The Design/construction/installation codes shall confirm to Latest edition of IS:14665 (All parts) AND also meeting any additional requirements of IS:4666, IS:1860 and IS:3534 and Any other equivalent code, subject to Employer's approval (Load carrying capacity)		
5.0	SCOPE OF WORK		
	i) Design, engineering, manufacture, inspection, delivery, erection, commissioning and handing over. ii) Maintenance & services during guarantee period. iii) Necessary erection / commissioning spares and consumables shall be included in vendor scope. iv) Necessary tools and tackles required for maintenance, testing and inspection shall be covered in vendor scope. v) Necessary chain and pulley block along with hand operated geared trolley arrangement for horizontal movement across the monorail, hoist, rope and hook arrangements at the machine room ceiling to carry out the maintenance and erection of equipment shall be supplied by Elevator vendor. The necessary mono-rail beam will be supplied by purchaser (BHEL). vi) A steel ladder for access to the pit shall be supplied by the Elevator vendor. vii) Guard to protect the hoist way including temporary barricades at hoist way openings shall be supplied by Elevator vendor. viii) Scaffolding as per erection requirement shall be provided by the Elevator vendor. After completion of handing over activities, the scaffolding materials may be taken back by the vendor. ix) All the electrical equipment including Lift well, Hoist way & machine room lighting with fittings, Power/control/trailing cables, MCCB/MCB & ELCB for 415 V AC 3ph supply (to receive the incoming feeders provided by customer) shall be included in the Elevator vendor scope. x) The vendor shall assume all responsibility for proper design and operation of each and every component of the elevator as well as the elevator as a whole. Complying with Indian electricity rules & Indian electricity acts and applicable statutory requirements (of Government of India and applicable States) as well as procedural formalities also shall be taken care by the Elevator vendor.		
6.0	EXCLUSIONS		
	Works not included in elevator contract, but furnished by others in accordance with local codes and regulations and the approved drawing of the Elevator vendor. i) Civil works associated with the Elevator pit. ii) Furnishing and installation of steel beams (Hoisting beams) in the machine room to lift equipment during installation and to facilitate maintenance.		
	iii) Machine room civil works including concrete flooring. iv) Steel structures for Columns and associated bracings and approach platforms up to landing doors at each level. v) Supporting steel material between hoist way & car will be provided by BHEL.		
7.0	ELEVATOR PARTICULARS & DESIGN PARAMETERS		
	i) Passenger cum Goods Elevator shall be provided with 1 no. fireman's switch (Alarm Switch). ii) The Elevator shall be located as per the plant layout drawing which will be provided during detailed engineering. iii) Entry to the Elevator shall be indicated in the enquiry. Foundation plan and elevation with landing levels shall be as per purchaser (BHEL) drawings.		
8.0	Design Criteria and Equipment specification for Passenger cum Goods Elevator.		
	i)	Design/Construction codes	Latest edition of IS : 14665
	ii)	Elevator Type	Rope & Pulley Type
	iii)	Type of service	Passenger cum Goods Elevator
	iv)	Number required	As per enquiry
	v)	Load carrying capacity	1000 kgs



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	vi)	Rated speed	1.0 meter/ sec for Passenger cum Goods Elevator.
	vii)	Position of machine room	Directly above elevator shaft
	viii)	Total travel	As per enquiry
	ix)	No. of floors to be served (Landing levels)	As per enquiry
	x)	Specification code	As per IS: 14655 (5 parts) latest edition.
	xi)	Size of platform	As per IS: 14655 & manufacturer's standard latest.
	xii)	Entrances	One number in each floor
		Car entrance and landing doors	As per BS:476 (Part 20 & 22)
	xiii)	Method of control Motor Speed Control: Logic Control:	Variable Voltage variable frequency (VVVF) control. Microprocessor based Control with automatic level adjustment. The control system shall be of field proven design and having satisfactory track record.
	xiv)	Flooring of Cabin	Vitrified ceramic tiles of mat finish
	xv)	False ceiling	Powder coated
	xvi)	Position of Machine room	Directly above the Lift shaft
	xvii)	Design, construction and finish of car	SS (ASTM-304 No: 4 Hairline finish)
	xviii)	Car door	SS (ASTM-304 No: 4 Hairline finish)
	xix)	Landing door	MS sheet fabricated, smooth finish, spray painted to approved shade.
	xx)	Car Enclosure	SS (ASTM-304 No: 4 Hairline finish)
	xxi)	Lighting and fan in the car	Recessed fluorescent light fittings for illumination level of 100 lux on Car floor shall be provided. Cabin charger ventilation fan with control suitable for operation on 240 V, 50 Hz, AC single phase power supply shall be provided. Portable light shall be provided on Car top. Adequate ventilation and illumination of car to be ensured.
	xxii)	Method of operation of car	Power operated type – automatic, Horizontal Centre opening / closing car and landing doors.
	xxiii)	Operation of Elevator	Automatic, simplex, selective, collective with and without attendant, through illuminated pushbutton station located inside the car with provision for locking control in Auto or attendant position.
	xxiv)	Car opening & hoist way opening	Protected by central opening sliding steel door.
	xxv)	Signals / Indicator	a) Car position informer in car both visual and audio, hall position indicator at all floors, telltale lights at all floors, battery operated alarm bell and emergency light with suitable battery, charger & controls. b) Soft touch keys and digital luminous display in car operating panel and on all floors landings. (All



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			fixtures in stainless steel face plates). Battery operated alarm bell and emergency light with suitable battery and battery charger and controls. Audio annunciation for car position indication shall also be provided inside the car. Overload warning indicator with visual & audio annunciation.
	xx)	Shaft lighting	The Elevator shaft shall be suitably illuminated by providing CFL fittings at every 3m (three metres) from bottom of Lift well.
9.0	DETAILS OF SPECIAL TREATMENT FOR ELEVATOR		
	As the Elevators are to be installed in a heavily polluted and dusty area in a thermal power station. All the Elevator components shall be given special corrosion resistant treatment.		
	i)	Cars & Counter weight	Anti-corrosive epoxy paint
	ii)	Fish plates	Anti-corrosive epoxy paint
	iii)	Car & Counter weight buffer	Anti-corrosive epoxy paint
	iv)	Supports(Buffer)	Anti-corrosive epoxy paint
	v)	Rail Brackets	Anti-corrosive epoxy paint
	vi)	Bracket & rail fasteners	Zinc-passivated with epoxy painted
	vii)	Tie down bolts	Zinc-passivated with epoxy painted
	viii)	Machine	Anti-corrosive epoxy paint
	ix)	Brake adjusting screw & coupling fasteners	Zinc-passivated
	x)	Bracket	Anti-corrosive epoxy paint
	xi)	Controller cabinet	Anti-corrosive epoxy paint as per industry standard.
	xii)	Hall buttons	Dust-proof with stainless steel hardware.
	xiii)	Car operating panel	Dust proof contact & button with aluminium face plate and SS hardware. Main face plate SS.
	xiv)	Governor	Cover and casting epoxy painted. Other components zinc plated.
	xv)	Governor Tension frame	Hot dip galvanised and anti-corrosive epoxy paint with M.S. shaft for sheave.
	xvi)	Car frame, level brace rods and counter weight frame	Epoxy paint as per IS-1477 Part 1 & 2.
	xvii)	Safety equipment (Linkages)	Zinc-plated
	xviii)	Safety switch and car gate switch	IP-65. Dust proof heavily zinc plated arm, stainless steel shaft and housing as per vendor standard.
	xix)	Guide shoe	Zinc-plated
	xx)	Cam bar mountings and channels	Zinc-plated and anti-corrosive epoxy paint
	xxi)	Counter weight frame	Anti-corrosive epoxy paint
	xxii)	Guide shoe with Nylon ribs	Zinc-plated
	xxiii)	Filter weights	Anti-corrosive epoxy paint



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	xxiv)	Rope fasteners	Zinc-passivated and chromate dipped
	xxv)	Hoist rope	Greased, Self-lubricating
	xxvi)	Governor rope	Greased, Self-lubricating
	xxvii)	landing door	Anti-corrosive two coats baked enamel paint
	xxviii)	Alarm and door open bells (Electronic hooter)	Painted.
	xxix)	Junction box	Metallic body -dust proof with Anti-corrosive epoxy paint
	xxx)	Hall position indicator and car position indicator	Dust proof with stainless steel enclosure and Face plate.
10.0	MECHANICAL EQUIPMENT		
10.1	ELEVATOR CAR		
	The car platform frame and sling shall be of steel construction. The platform shall be suitably isolated from its sling. The car shall be enclosed with suitably braced and reinforced sheet metal panel. The sheet metal panel shall have ventilation slots at the base. The cabin shall be provided with the following accessories: i) Car control station with position indicator inside the car and at landing platforms. ii) An emergency stop switch (shall have two sets of potential free contact. Second one shall be taken and terminated in machine room for further connection by owner). This is as per IS 14665 Part 2 Amendment 3 Clause 9.6 -“An emergency stop switch, of manually opened and closed type, shall be provided on top of every lift car and shall be marked conspicuously”. iii) 5/15A plug socket with switch on top of lift car.		
	iv) Telephone instrument shall be provided inside the car. Connection from the same shall be brought up to the machine room for further connection to plant network by customer. Telephone instrument provided inside the car shall have provision for hands free operation also, i.e. Speaker phone shall be provided for hands free operation. v) For better safety, elevator vendor to provide car top barricade on car top to ensure that service personnel stay inside the car region. A selector switch and a set of push buttons shall be provided on the top above the ceiling of the car to operate the elevator locally for inspection and maintenance. The selector switch when set to position “inspection” shall exclude control from other places and movement of the car in the desired direction shall be effected by the push buttons. For normal operation of the elevator, the selector switch shall be set to the position working. It shall be possible to operate the elevator only when the appropriate button is kept in pressed condition. The roof shall be strong enough to support at least two persons. vi) Adequate lighting and ventilation shall be provided in the Elevator car. The car shall be fitted with fan of adequate capacity and lighting with decorative fittings. The car platform shall be robust in construction and elegant in appearance. vii) The car shall be provided with an emergency alarm push button inside the Elevator car which shall be clearly marked. The alarm shall be clearly audible outside the Lift way in order to obtain assistance in case of breakdown or failure between the floors. viii) Car shall be equipped with handrails on three sides (material mirror stainless steel).		
10.2	CAR DOOR		



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	The car door shall be of hollow metal construction minimum 16 gauge thick sheet steel. Sides of the door shall be flush with all seams continuously welded. Guide shoes shall be rubber or roller type designed for operation on unlubricated guides. The car door shall be provided with locking gear of heavy and robust construction, so arranged mechanically and interlocked that the doors cannot be opened unless the Elevator car is within a particular landing zone. Conversely the Elevator shall not move until all the landing doors are closed and interlocked properly. Width of Car Entrance shall be min 1000 mm or as per applicable Indian or International Standard for Passenger cum Goods Elevator. The live load shall be taken into consideration while designing doors, door frame and hanger tracks. The car doors shall be designed such that their closing and opening is not likely to injure a person. A retractable safety shoe shall extend the full height and project beyond the front edge of the car, to open the closing door if and when it touches a person or an object. Alternatively opening of car by means of optical sensing shall also be provided.
10.3	LANDING DOORS
	All landing openings in the Lift well enclosure shall be protected with doors which shall extend the full height and width of the landing opening. The type of door provided shall be similar to the Elevator car door. Every landing door shall be fitted with a locking device. The door shall be suitably interlocked so that they cannot open unless the car is within a particular landing zone. The locking device is closed until the door is closed. The levers operating the locking devices shall not interfere with the landing side or Elevator enclosures. Landing doors of the elevators shall have fire resistance of at least one hour. These doors shall also be smoke tight as far as possible.
10.4	LOAD PLATE
	A load plate displaying the rated load of the Elevator in terms of persons and kilograms shall be fitted in the car in a conspicuous position.
10.5	SUSPENSION ROPES
	The car and the counter weights shall be suspended by steel wire ropes. Chain shall not be used for suspension. Not less than four independent stranded steel wire suspension ropes shall be used for car or counter weights of the Elevator with traction drive. The minimum diameter of the stranded rope shall not be less than 12.5 mm and minimum factor of safety shall not be less than 12. The suspension ropes shall conform to latest edition of IS 2365 – “Specification for steel wire suspension ropes for Lifts and hoists”.
10.6	SHEAVES AND PULLEYS
	All driving sheaves and pulleys fixed to and revolving with the shaft shall be fixed by means of sunk keys of sufficient strength and quality. Sheaves and pulleys shall be made of cast iron as per the latest edition of IS 14665 and free from cracks, sand holes and other injurious defects. They shall have suitable flanges and smoothly machined rope grooves. The diameter of the sheave or pulley shall be as specified in the latest edition of IS 14655 or equivalent International Standards.
10.7	SHAFT
	Shafts and axles shall be forged steel. They shall have sufficient rigidity and bearing surface. Any shaft when stepped shall be turned to a reasonable radius at the point of reduction.



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10.8	COUNTER WEIGHTS
	The Elevator shall be provided with suitable counter weights located in the Lift shaft. The counter weight shall be designed for smooth and easy operation of the Elevator and shall be in accordance with Indian Standard (or) equivalent International Standard. Suitable counter weight screen shall be provided in the Elevator shaft. The counter weights shall consist of cast iron weight contained in structural steel frame. The traction should be such that no appreciable slip may occur but that slip shall be free to take place upon the landing of either the car or the counter weights.
10.9	GUIDE RAILS
	Guide rails for the car and counter weights shall be machined 'T' sections and continuous throughout the entire length and shall be provided with adequate steel brackets or equivalent fixing of such design and spacing between brackets shall be such that to avoid any deflection during the normal operation. Guide rails section shall be adequate to withstand the forces resulting from the application of the safety gear when stopping the counter weights or fully loaded car. The guide shoes or their lining shall be easily renewable, adjustable and self-lubricated. Guides shall be of such length that it shall not be possible for any of the car or the counter weight shoes to run off the guides.
10.10	BUFFERS
	Sufficient number of buffers of spring loaded type shall be fitted below the Elevator car and counter weights. The buffers shall be capable of stopping the car or counter-weights without permanent damage or deformation to itself or any part of the Elevator equipment. The number of buffers shall be so fixed as to ensure proper sharing of the impact loads by all of them.
10.11	EMERGENCY SAFETY DEVICES AND BRAKES
	The Elevator shall be provided with safety device attached to the Elevator car frame and placed beneath the car. The safety device shall be capable of stopping and sustaining the Elevator car up to governor tripping speed with full rated load in car. The application of the safety device shall not cause the Elevator platform to become out of level in excess of 3 cm/m measured in any direction. Slack rope switches, if necessary, shall also be provided. The Elevator vendor shall also provide personnel evacuation system during the power failure to the Elevator. The Machine shall be provided with direct current spring set, solenoid release double shoe brakes of sufficient capacity to stop the car at any position with the design load. These brakes shall be designed in such a way that it gets applied automatically in the event of power failure.
10.12	AUTOMATIC RESCUE DEVICE (ARD)-(BATTERY DRIVE)
	Contractor shall provide a modern advanced electronic drive system of "RESCUING Passengers Trapped in an ELEVATOR" in case of power failure. In addition to the above, bell and cranking device to be provided with hand wheel connected with motor shaft for manual lowering of elevator to the nearest landing level. For all Elevators with ARD, an audio & visual indicator shall be provided inside the Elevator car to alert the person trapped inside that he/she is being rescued. Capacity of battery shall be such that minimum three rescue operations can be performed without recharging. ARD panel shall be suitable for floor mounting.
10.13	OVERLOAD DEVICE
	Every passenger Elevator shall be provided with an overload device, which will prevent the Elevator from starting in case the Elevator car is loaded to 110 percent of the rated capacity of the Elevator or more. Elevator shall remain stationery with door open. Audio & visual warning device (Load weighing device) shall be provided to alert the passenger in case of overload.



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10.14	OVER SPEED GOVERNOR AND GOVERNOR ROPES
	Governor shall be located where there is sufficient room for their proper operation and where they cannot be struck by the Elevator car or counter weight in the event of over run. Each governor shall be marked with tripping speed in terms of car speed in m/sec and the motor control and brake control circuit shall be opened before or at the time the governor trips. As per IS 14665 (part4/Sec 4):2001, the nominal rope diameter for over speed governor shall be minimum 6mm. However for elevators where travel height is more than 90 meters, the nominal rope diameter for over speed governor shall be minimum 8mm.
10.15	LEVELLING DEVICE
	The Elevator shall be provided with a two way automatic levelling device. The levelling device shall take care of overrun and under run of the car and rope stretch, such that car floor is within 6.0 mm from the landing level at all floors while in operation. Aprons of sufficient depth shall be fitted to the car floor to ensure that no space is permitted between the threshold and the landing while the care is being levelled to floor.
10.16	MACHINE ROOM AND OVERHEAD STRUCTURES
	All the overhead machinery shall be supported on beam to be furnished by the contractor. The machinery support beam shall rest on top of or be designed to be framed into the contractor's structural steel frame for the boiler house. The Elevator drive controller and all other apparatus and equipment of Elevator installation, except such apparatus and equipment which function in the machine room shall be located at the top of the Lift well. Adequate machine room and hoist way lighting shall be provided by the Elevator vendor. The maximum loads transmitted by the single heaviest equipment both during erection and maintenance of the Elevator to the machine room floor and other structures like guides etc. shall be furnished by the Elevator vendor within 15 days of placing the award letter. Sound reducing materials below machines in machine room shall be provided. Machine room shall be provided with minimum 200 Lux illumination. MACHINE ROOM Air Conditioning: Each Machine room shall be provided with 1 no. of 2 tonne A/C unit. (minimum).
10.17	TERMINAL STOPPING AND FINAL LIMIT SWITCHES
	The Elevator shall be equipped with an automatic stopping device arrangement to bring the car to a stop at the terminal landings independent of the regular operating device in the car. Such stopping device shall act independently of the operating device, the final limit switches and buffer.
	Final limit switches shall be provided to stop the car automatically within the top and bottom clearance independent of normal operating device and the terminal stopping device. The final limit switch shall act to prevent movement of the car under power in both directions of travel and shall after operating, remain open until the Elevator car has been moved by a hand operating mechanism within the limits of normal travel. Elevator shall be suitable for continuous 24 hours round the clock operation.
11.0	ELECTRICAL EQUIPMENT AND CONTROLS
11.1	OPERATION AND INTERLOCKS
	1. Selective duplex collective, automatic operation with or without attendant through illuminated push button station located inside the lift car. 2. Door opening shall be automatic door operation and electronic door protection system for opening/ closing of car and landing doors. 3.Car operating panel with luminous buttons, car position indication in car (both visual and audio) combined with direction arrows, overload warning indicator, battery operated alarm bell and emergency light and fan & hands free speaker telephone set with suitable battery charger & controls. 4. Emergency indicator to indicate the location of elevator in case of elevator being stuck up between the floors through automatic flashers (both audio and visual). 5. Electronic door



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	detector (infra red curtain type). 6. Two push button stations, one for upward movement and the other for down ward movement at each intermediate landing and one push button at each terminal landing shall be provided in order to call the car. Digital hall position indicator at all floors, tell lights at all floors shall also be provided by the bidder. 7. For facilitating movement of visually & hearing impaired persons, hall lantern and car arrival chimes shall be provided. 8. All fixtures shall be in stainless steel face plates. 9. Push buttons shall be fixed in the car holding the doors open for any length of the time required. 10. All other safety/ protection/ operation interlocks as required by IS: 14665 (latest edition).
11.2	ELEVATOR DRIVE
	The Elevator drive shall be equipped with automatic electromagnetic coil type brakes. The Elevator shall be driven by a drive suitable for method of control offered by the Elevator vendor. No friction gearing or clutch mechanism shall be used for connecting the main driving gear to the sheaves.
11.3	ELECTRIC MOTORS
	Motors shall be as per IS 325 and suitable for the Variable Voltage Variable Frequency (VVVF) application. All motors shall be squirrel cage induction type, suitable for operation at 415 V (+/- 10% variation), 3 phase, 3 wire, 50HZ (+3% to -5% variation). Motor shall be provided with thermal class 130 (B) or better insulation. supply suitable for frequent starting with S4 duty class (S3 duty class also acceptable, if necessary to that application and subject to end user acceptance), CDF 40%, Maximum 150 starts per hour at 50 Deg. C ambient and with IP 54 protection class. Motor pull out torque shall be at least 240% of rated torque. Motor shall be of TEFC type. Motor insulation shall be class F or superior with temperature rise limited to 70 Degree Celsius. Motor paint shade shall be RAL 5012(tentative).
11.4	CONTROLLERS
	The controllers shall be designed to start, accelerate, stop and reverse the Elevator when the appropriate push buttons are pressed. It shall be arranged so as to provide maximum convenience to the operator. Contact finger
	Buttons shall be easy to adjust and replace. The speed control device shall be such as to give smooth, easy and accurate speed control. The Elevator controls shall be housed in dust and vermin proof enclosures. The controls shall be wired with stranded copper conductor cables. All equipment mounted shall be neatly labelled as per wiring diagram. Ventilating louvers are to be provided in the panels. Control panel shall be suitable for floor mounting.
11.5	CABLES AND INTERNAL WIRING
	Wiring shall be done as required to interconnect all Elevator electrical equipment including all power wiring from the main supply source in the machine room. Power cables shall be 1100 V grade multi core, stranded with XLPE insulation, FRLS type ST2 inner sheathed, galvanised steel wire armoured and overall extruded FRLS, Type ST2 PVC outer sheath. If unarmoured cables are used all the cabling/wiring between the equipment in the lift machine room and between machine room and equipment in the lift well and at the landings shall be wired in HDP conduit/ galvanised steel conduit. The circular trailing cables shall conform to IS 4289 Part-I (Elastomer insulated) or IS 4289 Part II (PVC insulated) / Flat type trailing cable shall conform to IEC 60227-06. All other cables shall conform to latest edition of IS: 7098, IS:1554 & IS:5831. Following FRLS properties shall be complied with. a) Oxygen index of min. 29 (as per IS:10810 Part-58) b) Acid gas emission of max. 20% (as per IEC-754-I). c) Smoke density rating shall not be more than 60% (as per ASTM D-2843). All cables shall have FRLS properties. LT Cable: 1100 volt, 90 Deg.C rating, heavy duty power cables with stranded aluminium Conductor, extruded



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	XLPE insulation, extruded HRPVC,FR-LSH inner sheath, aluminium round wire armour for single core cables and galvanized steel strip /wire armour for three (3) core cables, and extruded HRPVC, FR-LSH overall sheath. Trailing Power cable: 1100 V Grade flexible trailing cable shall be tinned copper of Class - 5 of IS : 8130, heat resistant elastomeric compound based on EPR insulation, inner sheath of heat resistant elastomeric compound PCP sheath, nylon cord reinforcement and heat resistant, oil resistant and flame retardant heavy duty elastomeric compound FRLS CSP outer sheath. Control Cables: 1100 Volt grade, 85 deg C rating, control cables with stranded copper conductors, HRPVC Insulation, extruded HRPVC, FRLS Inner sheath, round wire/strip armour as specified elsewhere in the specification and extruded HRPVC, FRLS overall sheath. The cables shall be suitable for use in 1100V non-effectively earthed system. Control cable shall generally conform to IS: 1554 latest and have ISI mark. Armour shall be GS.
11.6	CABLING AND EARTHING
	Earthing shall be carried out as per IS 14665, IS 3043 and Indian Electricity Rules. The Elevator structures, motor, frames, metal cases and all electrical equipment including conduit, cable armouring and guards shall be properly bonded and earthed by two separate and distinct connection. The earth connection station mat shall be done by the owner.
11.7	POWER SUPPLY
	Each Elevator shall be provided with a separate three phase, three wire 415V feeder of adequate rating for lighting, air conditioner and control panels will be provided in the machine room by BHEL. The junction box having MCCB/MCB/ELCB Isolation of adequate rating shall be arranged by the vendor to receive the above supplies. The Elevator vendor shall also indicate the proposed location of junction box in the machine room. All further cabling and wiring from the junction box shall be carried out by the Elevator vendor. The vendor shall arrange to tap power supply required for constructional purposes from the point terminated by the owner.
12.0	OTHER REQUIREMENTS
	Electric high speed door operators for the opening and closing of the car doors and landing doors shall be furnished and installed. The car and landing doors shall be mechanically connected and shall move simultaneously in opening and closing. The car door and landing door shall be power closed and shall be controlled in opening and closing by oil cushioning mechanism built into the gear unit or alternate arrangement equally / better than this. Necessary lockable switches shall be provided in the Elevator machine room to control the operation of the door. Should the electric power fail, it must be possible for the doors to be opened from within the car, provided the car is exactly at the landing level. Overload relays shall be provided to protect the drive motor against overload or a power failure. Suitable protection shall be provided on the controller to protect the Elevator equipment from phase reversal, low voltage. Suitable arrangement shall be provided to intimate unit control room during emergency in the form of audio-visual alarm. Complete set of special tools and tackles required shall be supplied along with Elevator. Each tool and tackle shall be stamped so as to be identified easily for its use and size. Tools shall be supplied in a steel tool box. The list of tools and tackles shall be furnished along with the offer. One number Fire extinguisher (suitable for electrical fire) shall be provided along with each elevator.



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13.0	SPARES,TOOLS & TACKLES																																																			
13.1	TOOLS:																																																			
	Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply of the machine. List of special tools & tackles shall be decided by bidder as per his proven practice. When special tools are provided, they shall be packaged in separate, boxes with lugs and marked as "Special Tools for (tag / item number)."Each tool shall be stamped or tagged to indicate its intended usage. Levers and eye bolts for the removal of parts to be serviced shall be submitted with special tools																																																			
13.2	START UP & COMMISSIONING SPARES																																																			
	Start-up & Commissioning Spares shall be part of the main supply of the Elevators. Start-up & commissioning spares are those spares which may be required during the start- up and commissioning of the equipment/system. All spares required for successful operation till commissioning of elevator shall come under this category. Bidder shall provide an adequate stock of such start up and commissioning spares to be brought by him to the site for the equipment erection and commissioning. The spares must be available at site before the equipment's are energized. The List of such spares to be provided during bidding stage.																																																			
13.3	RECOMMENDED SPARES																																																			
	Bidders shall also furnish the Recommended spares list along with the offer required for 3 years of normal operation of the plant and should be independent of the list of the mandatory spares. Prices of recommended spares will not be used for evaluation of the bids. The price of these spares will remain valid up to 6 months after placement of Notification of Award for the main equipment.																																																			
13.4	MANDATORY SPARES:																																																			
	Bidder to quote for below mentioned mandatory spares with break up price: <table><tr><th>S. No.</th><th>Item</th><th>Quantity</th></tr><tr><td>1.</td><td>Friction block</td><td>2 nos.</td></tr><tr><td>2.</td><td>Guide roller of each type</td><td>20 % of total population or 3 nos. of type whichever is higher.</td></tr><tr><td>3.</td><td>Contactors of each type</td><td>2 nos.</td></tr><tr><td>4.</td><td>Control Transformer</td><td>1 no. of each type</td></tr><tr><td>5.</td><td>Time device</td><td>2 nos. of each type</td></tr><tr><td>6.</td><td>Rectifiers</td><td>4 nos. of each type</td></tr><tr><td>7.</td><td>Overcurrent relay</td><td>2 nos. of each type</td></tr><tr><td>8.</td><td>Auxiliary relay</td><td>3 nos. of each type</td></tr><tr><td>9.</td><td>Resistor</td><td>3 nos. of each type</td></tr><tr><td>10.</td><td>Fuses for each rating</td><td>20 % of the total population</td></tr><tr><td>11.</td><td>Limit switches for each type</td><td>3 nos.</td></tr><tr><td>12.</td><td>Push button</td><td>3 nos. of each type</td></tr><tr><td>13.</td><td>Contact device (if applicable)</td><td>3 nos. of each type</td></tr><tr><td>14.</td><td>Brake motor</td><td>2 nos. of each type</td></tr><tr><td>15.</td><td>Transmitters</td><td>2 nos. of each type</td></tr><tr><td>16.</td><td>Switches for each type</td><td>3 nos.</td></tr></table>	S. No.	Item	Quantity	1.	Friction block	2 nos.	2.	Guide roller of each type	20 % of total population or 3 nos. of type whichever is higher.	3.	Contactors of each type	2 nos.	4.	Control Transformer	1 no. of each type	5.	Time device	2 nos. of each type	6.	Rectifiers	4 nos. of each type	7.	Overcurrent relay	2 nos. of each type	8.	Auxiliary relay	3 nos. of each type	9.	Resistor	3 nos. of each type	10.	Fuses for each rating	20 % of the total population	11.	Limit switches for each type	3 nos.	12.	Push button	3 nos. of each type	13.	Contact device (if applicable)	3 nos. of each type	14.	Brake motor	2 nos. of each type	15.	Transmitters	2 nos. of each type	16.	Switches for each type	3 nos.
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17.	Receiver	2 nos. of each type
18.	Bearing of each type & size	2 nos.
19.	Roller of each type	3 nos.
20.	Worm gear spares	
	a) 'O' ring	3 Sets*
	b) Sealing ring of each type	3 Sets*
21.	Spares for brake	
	a) Fan	2 nos. of each type
	b) Magnetic coil	3 nos. of each type
	c) Brake disc	2 Sets*
	d) Brake pad	2 Sets*
22.	Bushing (for door front)	2 Sets*
23.	Pinion	2 nos. of each type

Note :

If above Mandatory spares are not applicable to vendor Elevator design, vendor shall quote Equivalent/ applicable spares against each items.

* Unless otherwise stated, a set shall mean complete replacement for one equipment.

1. Any change in size, material, design etc, which obviates one to one replacement of the part shall be considered a different type.

2. Wherever quantity has been specified as percentage (%), the quantity of mandatory spares to be provided by contractor shall be the specified percentage (%) of the total population of the plant. In case the quantity so calculated happens to be a fraction, the same shall be rounded off to next higher whole number.

3. Whenever the quantities have been indicated for each type, size, thickness, material, radius, range etc., these shall cover all the items supplied and installed and the breakup for these shall be furnished in the bid.

4. In case spares indicated in the list are not applicable to the particular design offered by the bidder, the bidder should offer spares applicable to offered design with quantities generally in line with the approach followed in the above list. 5. Price of each and every item is to be given separately.

Bidder shall quote for the "Mandatory Spares Part List", and it will be considered for L1 evaluation. Initial spare parts items shall be handed over separately and shall not be mixed with the supply of the main equipment parts. Spares shall be sent in pre-decided lots in containers/secure boxes. All boxes/containers are to be distinctly marked in red color with boldly written "S" mark on each face of the containers. Spares shall not be dispatched before dispatch of corresponding main equipment's. Each item shall be labelled in English and be packed against damage and sealed to prevent deterioration from corrosion. The protection shall be sufficient for a minimum of 10 years' storage in a dry weatherproof building.

All spares supplied under this contract shall be strictly inter-changeable with the parts for which they are intended for replacements. All the Initial spares shall be manufactures along with the main equipment components as a continuous operation as per same specification and quality plan. Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply of the



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	machine.
14.0	DRAWINGS / DOCUMENTS
	The following preliminary documents / drawings should be enclosed along with the offer without fail. i) Detailed description of the system offered. ii) List of thermal power where the offered system is in operation. iii) Performance certificate of the system offered. iv) Write-up on interlocks, controls and safety devices provided. v) General Arrangement of Elevator (including hoist way, pit well etc.) vi) General Arrangement of machine room and equipment in machine room. vii) Electrical control scheme with legend and write-up. viii) Machine room Air-Conditioning details.
	ix) Foundation and loading details of machine room floor and the concrete structure. x) Filled in vendor data sheet for Elevator, Main motor and Door operator motor. xi) Filled in vendor quality plan. xii) The major components of Elevator with weight details to be indicated by the vendor in the offer itself. xiii) The make, type, capacity, range of all bought out items xiv) Any deviation from the enquiry specification shall be indicated in the "Sub-delivery Enquiry Deviation Format" attached along with the enquiry. No deviations, unless explicitly taken up by vendor in the enquiry stage itself in the said format and accepted by BHEL in writing, shall be considered after firm order. In case no deviations are there, vendor to indicate "No-deviation" in the fully filled up format. The following documents / drawings shall be submitted within 15 days from the firm order. i) Elevator General Arrangement drawings for BHEL/Customer approval. ii) Elevator Technical Datasheet Separate contract-wise drawing approvals shall be obtained by vendor before manufacture of elevators.
15.0	ERECTION AND COMMISSIONING
1.	The erection and commissioning of elevators & accessories shall be done by bidder. Bidder shall include complete erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs till handing over at site under his scope of work.
2.	TA/DA, boarding and lodging shall be borne by the bidder and shall be included in quoted rate.
16.0	PERFORMANCE GUARANTEE
	All performance tests for elevators shall be carried out in accordance with any latest international codes/standards. 1) Bidder shall furnish Performance guarantee for the design, manufacture, material, safe and trouble-free operation of the Elevators and its accessories 2) Bidder shall guarantee and demonstrate the rated capacity of the elevator. 3) The Bidder shall ensure a design of the equipment to achieve an average target availability of 90%. Noise level-≤85 dB (A) at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed After the completion of the installation, maintenance and service for the equipment furnished under this specification shall be provided by the vendor for a period of eighteen months. This service shall include monthly inspections of the installation during regular working hours by trained employees and shall include all necessary adjustments, greasing and oiling, cleaning, supply of genuine standard parts to keep the equipment in proper operation except any part made necessary by misuse, accidents or negligence caused by others.



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17.0	ACCEPTANCE
	After erection, the performance of the Elevator shall be tested for ascertaining the conformity with the specification and upon satisfactory completion of the tests, the Elevator will be taken over. The responsibility for obtaining commissioning and handing over protocol signed by the customer lies with the Elevator vendor.
18.0	WARRANTY
1.	The Bidder warrants that the equipment's/items shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed. The Warranty Period shall be twenty four (24) months from the date of delivery or eighteen months (18) months from the date of commissioning, whichever first occurs. If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Bidder, the Bidder shall promptly, in consultation and agreement with BHEL regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Bidder shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect.
2.	In case of failure of the equipment to meet the guarantee, CUSTOMER /BHEL reserves the right to reject the equipment. However, CUSTOMER /BHEL reserves the right to use the equipment until new equipment supplied by bidder meets the guaranteed requirement.
19.0	FIRST FILL OF CONSUMABLES:
1.	Bidder's scope shall also include supply and filling of all chemicals, reagents, resins, lubricants, grease, filters and consumable items for operation up to COD including top up requirements at the time of issuance of PAC/declaration of COD. All lubricants proposed for the plant operation shall be suitable for all operating and environmental conditions that will be met on site consistent with good maintenance procedures as instructed in the maintenance manuals.
2.	Detailed specifications for the lubricating oil, grease, gases, servo fluids, control fluids, chemicals including items qualities and quantities required per month of the plant operation for the CUSTOMER /BHEL's approval herein shall be furnished eighteen (18) months prior scheduled COD of the 1 st unit. On completion of erection complete list of bearings/equipment giving their location and identification marks shall be furnished to CUSTOMER along with lubrication requirements. All types of chemicals, consumables, lubricants and grease shall be readily obtainable locally and the number of different types shall be kept to a minimum. For each type and grade of lubricant recommended, bidder shall list at least three equivalent lubricants manufactured by alternative companies.
20.0	TRAINING
	Successful bidder shall provide comprehensive training for CUSTOMER Consultant Engineering, O&M, Erection & Commissioning staffs at site covering all aspects of the Elevators - Operation & Maintenance, Troubleshooting etc.
21.0	CONFLICT



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	Bidder's equipment shall be designed for and shall meet the service, performance and minimum level of quality requirements specified. Bidder shall be solely responsible for advising CUSTOMER in writing of any conflicts between the specifications and Bidder's design, including performance and levels of quality. Bidder agrees that its obligations, liabilities and warranties shall not be diminished or extinguished due to its meeting the requirements of the Specification.
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22.0 GENERAL REQUIREMENTS:

S.No	Description
1)	Metric unit shall be used in the drawings and in the any displays on the equipment's. Special attention should be taken that the unit of pressure shall be in dual scales of kPa and kg/cm ² G. For instance the pressure gauges should have dual unit's indication.
2)	Descriptions in the drawings, in the documents, and in the displays shall be in English
3)	All rotating parts such as coupling shall be covered with suitable protective guards. Guards shall be easily removable type.
4)	The equipment shall be designed to withstand the corrosive and moist environment in which these are proposed to operate.
5)	Noise level produced by any rotating equipment individually or collectively shall not exceed 85 dB measured at a distance of 1.0 meters from the source in any direction and 1.5m above operating floor.
6)	The overall vibration level shall be as per ISO 10816.
7)	Suitable drain connections shall be provided.
8)	The equipment shall be suitable for stable operation continuously.
9)	Corrosion allowance: Corrosion allowance for entire equipment shall be in accordance with latest applicable Indian / International standard.
10)	Unless otherwise specified , flanges shall be in accordance with ANSI B16.5 Class 150
11)	Name plate: All equipment shall be provided with nameplates indicating the item number and service name. Name plates shall be of 304 Stainless steel plate and placed at a readily visible location. Nameplate of main equipment shall have enough information, which will be confirmed during engineering phase. Stainless steel nameplates for all instruments and valves shall be provided.
12)	Rotation arrows shall be cast in or attached with stainless steel plate on each item of rotation equipment at a readily visible location.
13)	Unless otherwise specified, all equipment items where the weight exceeds 15 kg shall be provided with suitable lifting lugs, ears or ring bolts or tapped holes for lifting rings. Minimum shock factor for lifting lugs shall be minimum 2.0. The position of lifting lugs and reference dimension shall be shown on GA and/or outline drawings. NDT shall be conducted for lifting lugs. When any spreader bars are required for lifting and laydown, the bidder shall provide spreader bar with equipment.



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S.No	Description
14)	Skid Mount/Transportation: Equipment shall be fabricated as skid mount design as much as practical to minimize erection at the site.
15)	If the driver/driven equipment train is in the resonance condition or any vibration problems occur, the bidder shall solve the problems in a timely manner.
16)	Bidder shall provide the necessary gaskets.
17)	All the surfaces of the carbon steel should be rust prevented before shipment for the period of at least 12 months for storage and construction.
18)	Bidder to provide capacity of crane or hoist required for material handling and the details of heaviest component to be handled.
19)	The list of all Bought out items with makes and country of origin to be mentioned along with offer to be submitted.
20)	Quality Plan to be submitted along with the offer.
21)	Cost towards the participation in discussions/meetings, providing technical assistance during technical discussions/meetings with customer for approval of drawing/documents etc. TA/DA, boarding and lodging to attend these meetings shall be borne by the bidder and shall be inclusive in supply portion.
22)	Material of construction for all equipment/components shall be subject to CUSTOMER / BHEL approval during detail engineering. Accordingly bidder shall consider MOC for all equipment/component as per best engineering practice, global standard and global references.
23)	Bidder to provide sub vendor list and Bidder shall strictly adhere to CUSTOMER approved vendor list . In case bidder proposes an additional vendor for an item or vendor approval is required for any new item, acceptance shall be subject to approval by CUSTOMER / BHEL before placing order and bidder shall submit relevant documents as per attached Sub-Vendor Questionnaire .
24)	It shall be the complete responsibility of the successful bidders to obtain "Sub Vendor Approval" from BHEL / CUSTOMER for all equipment's & components. Any delay in sub vendor's approval should not affect the project schedule. If any of the sub vendors does not have the approval of CUSTOMER / BHEL, the same may be replaced with another CUSTOMER /BHEL approved sub-vendor only, without any price implications to BHEL.
25)	The modalities of inspection (Stage, Final, In-process) shall be finalized during detail engineering after submission of quality assurance plan (QAP). It shall be reviewed by the CUSTOMER consultant and BHEL. Bidder shall follow the procedures of inspection as per the approved QAP. Bidder has to submit the following documents along with inspection call and if any other documents required as per approved QAP. - Raw material inspection certificate - Internal test reports - Statutory certificates as required. - All inspection & testing shall be carried out based on the following documents:



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S.No	Description
	a. Relevant Standards b. Specifications c. Approved drawings d. Data Sheets e. Calibration certificate for all the measuring instruments f. Bidder should also coordinate in getting the MDCC's (Material Dispatch clearance certificate) and all types of IC's (Inspection Certificates) from the CUSTOMER along with BHEL.
26)	During detail engineering, bidder to strictly adhere to BHEL/ CUSTOMER drawing formats, document numbering, quality plan & FQP formats
27)	The identification and numbering of equipment, systems, items, etc. of supply, as well as of all documents and drawings shall be in accordance with reference Designation System for Power Plants - KKS system.
28)	Complete detail engineering drawings, calculations, selection of components etc. shall be reviewed & subject to approval of BHEL/ CUSTOMER during detail engineering
29)	Bidder shall furnish necessary inputs & drawings of all equipment in editable Auto CAD/ MS-Word /Excel format.
30)	During detail engineering, successful bidder shall ensure flow of drawings/documents as per schedule. Any comments from BHEL/ CUSTOMER should be addressed timely by the bidder.
31)	Bidder to note that list above is not exhaustive and any work /items required for completing the smooth operation and ensuring satisfactory running of the machines till final hand over to the end user shall also be in the scope of the bidder.
32)	Bidder shall submit the signed and stamped copy of all the pages which constitutes this technical enquiry specification signed by authorized signatory and clearly mentioning each clause under following two categories to avoid any ambiguity in scope understanding & the scope division along with technical offer. a. "Accepted without deviation and considered in scope of work" b. "Not considered in scope of work"
23.0	PACKING AND FORWARDING
1)	All elevator items to be packed in container and dispatched to site. Vendor to choose suitable sized container to accommodate the elevator and its accessories. Vendor can choose used container, which shall have leak tight and rain water should not enter into the internals of container during storage in the outer yard of power plant. The container shall be provided with lock and key. The key shall be retained with Supplier and packed material shall be dispatched to site. Before erection starts the container shall be opened in presence of BHEL site store concern person for verifying the materials. All items required for assembling shall be packed in container only. Vendor to ensure the



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S.No	Description
	same before generating packing slip. Evaluation will be made for total cost to BHEL project wise Note: Packing container shall be non-returnable.
2)	The mandatory spares shall be wrapped in polythene bags & packed in a strong rigid wooden box and send to BHEL BAP Ranipet stores.
3)	Equipment and materials in wooden cases or boxes shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable to tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventive compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper.
4)	Each container should have the following inscriptions and signs stenciled with an indelible ink legibly and clearly: a. Destination b. Package Number c. Gross and Net Weight d. Dimensions e. Lifting places f. Handling marks and the following delivery marking
5)	Each container or shipping units shall be clearly marked or stenciled on at least two sides with project details as per enquiry.
6)	Each mandatory package box has to contain a packing list in a waterproof envelope. All items are to be clearly marked for easy identification against the packing List. All cases, packages etc. are to be clearly marked on the outside to indicate the total weight where the weight is bearing and the correct position of the slings are to bear an identification mark relating them to the appropriate shipping documents. All stencil marks on the outside of cases are either to be made in waterproof material or protected by shellac or varnish to prevent obliteration in transit.
7)	The packing slip shall contain the following information: - Customer name, Name of the equipment, Purchase Order number with Date, Address of the delivery site, Name and Address of the Sender, Serial Number of Elevator, BHEL item Code, Gross Weight and Net weight of Supplied items.
24.0	DOCUMENTATION
A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER
	The Bidder shall submit all documents, drawings, diagrams and all such information, which are necessary to fully understand the offer for techno – commercial evaluation as specified.
B	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT



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S.No	Description
	The Successful bidder shall submit necessary data, documents and drawings for review, approval as specified. All necessary GA drawings, sections, sub-assembly drawings, specifications of main and sub components and necessary set of operation & maintenance manual as asked by CUSTOMER must be furnished by bidder in soft and hard copy forms. Unless agreed otherwise, Ten (10) hard copies and five (05) sets of electronic copies of all documents are to be submitted in the English language. Electronic Copies shall be submitted in primary original data format (e.g. DOC, XLS, DWG) as well as in a printable non-proprietary document format (e.g. PDF). However all the engineering related information shall be furnished in soft form to BHEL.
25.0	QUALITY ASSURANCE AND TESTING
	i) Vendor shall prepare and provide Quality plan along with enquiry. This QP will be reviewed by BHEL and if any comments given by BHEL shall be incorporated by vendor. ii) In case of order receipt, this QP will be submitted for BHEL/ CUSTOMER consultant approval. Any comments given by BHEL/ CUSTOMER consultant shall be incorporated by vendor for further approval by BHEL/ CUSTOMER consultant. iii) Elevators are subject to inspection by BHEL & CUSTOMER and inspection call shall be given 15 days in advance. v) Materials can be despatched only after obtaining CHP clearance & MDCC clearance from BHEL/ CUSTOMER consultant.
26.0	O&M MANUALS
	Vendor to furnish standard O&M manuals for each capacity of elevator, immediately after the release of first purchase order for BHEL's further use (Two copies of CD-ROM). The O&M manual prepared shall be such that the same shall be usable along with the relevant drawing for each project. Project wise O&M manuals along with project-wise details, if any, has to be updated by vendor and handed over to site (Customer & BHEL/Site, after commissioning of elevator) in necessary format as desired by customer. All necessary GA drawings, sections, sub-assembly drawings, specifications of main and sub components and necessary set of operation & maintenance manual as asked by CUSTOMER must be furnished by bidder in soft and hard copy forms. For all documents softcopy format shall be searchable pdf, however in addition all drawings, diagrams shall be supplied in ACAD or other editable format and all lists in Excel format. Further break up of technical documents will be discussed during finalization of the purchase contract. Unless agreed otherwise, Ten (10) hard copies and five (05) sets of electronic copies of all documents are to be submitted in the English language. In addition However all the engineering related information shall be furnished in soft form to BHEL.
27.0	LIST OF ELEVATOR OPTIONAL PRICES
	The following optional prices to be indicated along with offer. i) Rate for addition / deletion of 1 number landing. ii) Rate for addition / deletion of 1Mtr. in travel height. iii) Additional price of Automatic Rescue Device (ARD) for increased height of 15 Mtrs. iv) Audio annunciation in the form of metres

SIGNATURE OF BIDDER

BIDDER SIGN WITH SEAL AND DATE:



TECHNICAL SPECIFICATION OF ELEVATORS

UPRVUNL:FGD:ELEVATOR

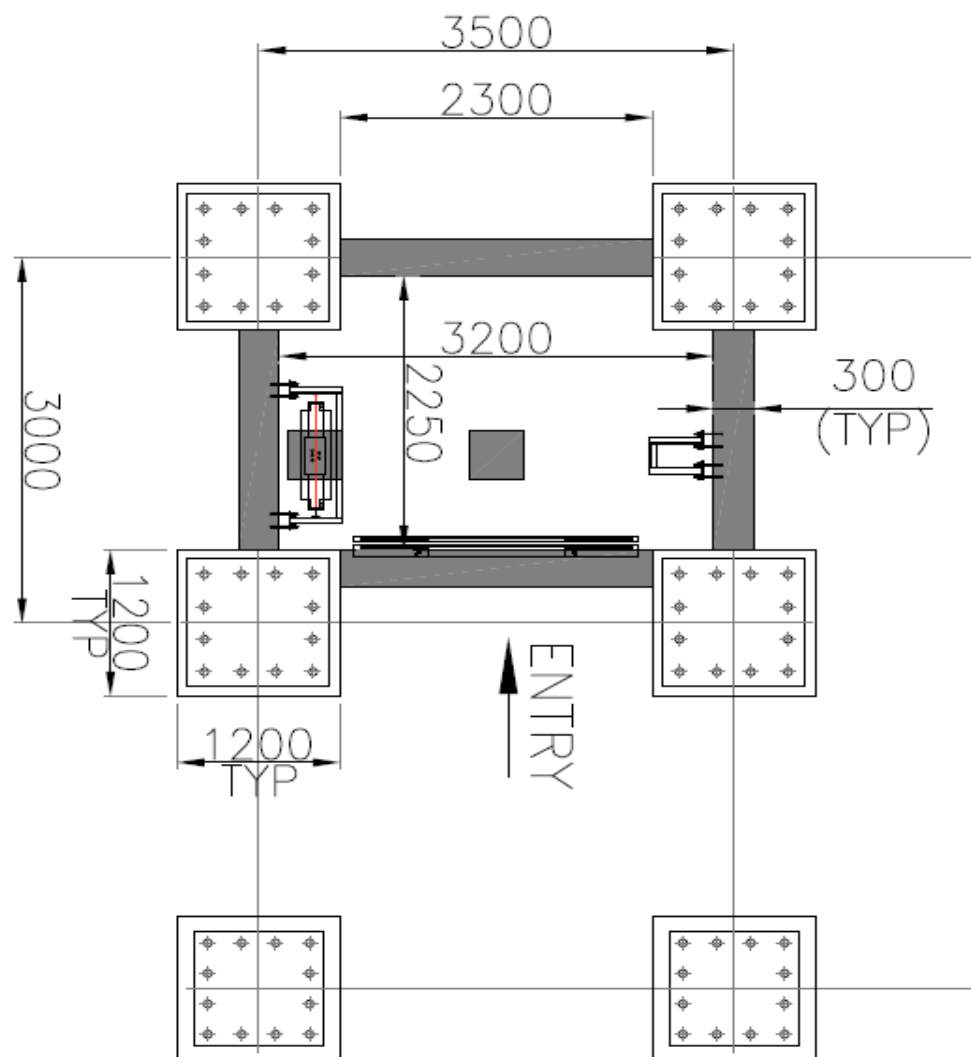
NAME

DESIGNATION

28.0 SHAFT AREA AND TYPICAL PROPOSED PIT PLAN DETAILS

TENTATIVE SHAFT AREA FOR ELEVATOR IS 3500 MM X 3000 MM.

TYPICAL PROPOSED
PIT PLAN DETAILS





TECHNICAL SPECIFICATION OF ELEVATORS

UPRVUNL:FGD:ELEVATOR

ANNEXURE – I- SCHEDULE OF GUARANTEES

Sl. No	Description	Data
1.	Rated elevator load capacity Kg	: Bidder to provide
2.	Noise level at a distance of 1.0 meter from the equipment at site and 1.5 m above operating floor dB(A)	: Bidder to provide
3.	Availability (%)	: Bidder to provide
4.	Scheduled Maintenance (Minor Overhauls): Recommended intervals between maintenance outages hours	: >25000 hours operation.
5.	Scheduled Maintenance (Major Overhauls): Recommended intervals between maintenance outages hours	: >75000 hours operation.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF ELEVATORS

UPRVUNL:FGD:ELEVATOR

ANNEXURE-II

REFERENCE LIST as per format shown below. (At least One reference plant details)

S. No	Project Name , Customer & Plant capacity	Coal fired Yes/No	Model	Elevator Capacity	No. of floors	Travel & travel speed	Year of Commg	Qty

Note:

Performance certificate (End user Letter head) and PO copy is mandatory for One (01) reference plant.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF ELEVATORS

UPRVUNL:FGD:ELEVATOR

ANNEXURE-III

LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT

Sl No	Clause No	Page No	Description of Deviation

Note: Enlarge the table to incorporate items

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

BIDDER SIGN WITH SEAL AND DATE:



TECHNICAL SPECIFICATION OF ELEVATORS

UPRVUNL:FGD:ELEVATOR

		Bidders Acceptance/ Comments
ANNEXURE-IV : LT Motor Datasheet Format	Refer Enclosed Datasheet Format. Vendor to Fill & submit.	
ANNEXURE-V : MOTOR SPECIFICAION	Refer Enclosed specification.	
ANNEXURE-VI Painting Schedule	Refer Enclosed specification.	

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

BIDDER SIGN WITH SEAL AND DATE: