
TECHNICAL SPECIFICATION FOR ELEVATORS AND ACCESSORIES FOR LIMESTONE GRINDING SYSTEM BUILDING

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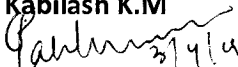
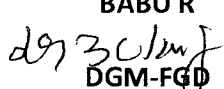
CUSTOMER	: M/s. BIFPCL Bangladesh
PROJECT	: Maitree 2X660MW
APPLICATION	: FLUE GAS DESULPHURIZATION SYSTEM
TENDER REF	: BIFPCL: MAI: FGD: ELEVATOR: R00



BHARAT HEAVY ELECTRICALS LIMITED
(A GOVT OF INDIA UNDERTAKING)
Flue Gas Desulphurization Group
Ranipet

	TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW
BIFPCL:MAI:FGD:ELEVATOR:R00	

TECHNICAL SPECIFICATION FOR ELEVATORS & ACCESSORIES FOR LGS BUILDING

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Sl.No	TECHNICAL DELIVERY CONDITIONS	
1.0	PROJECT INFORMATION	
	Owner	BIFPCL (BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (PVT.) LIMITED), Bangladesh
	Buyer	BHEL, Ranipet
	Process/Application	Flue Gas Desulphurization
	Bangladesh-India Friendship Power Company (Pvt.) Ltd. (BIFPCL) is a 50: 50 Joint Venture Company of Bangladesh Power Development Board, Bangladesh (BPDB) and NTPC Limited, India (NTPC), incorporated under the laws of Bangladesh. BPDB is a statutory body constituted under the Bangladesh Water and Power Development Board Order 1972, and is vested with a significant portion of the generation and distribution of electricity in Bangladesh. NTPC Limited is a Maharatna company incorporated under the Indian Companies Act, and as India's largest power company, has a diversified portfolio covering the entire value chain of the power generation business. Pursuant to the implementation agreement dated April 20, 2013, as entered into between the Government of the People's Republic of Bangladesh, and BIFPCL, and the power purchase agreement also dated April 20, 2013, as entered into between BIFPCL and BPDB, BIFPCL has entrusted BHEL the development of the Coal fired 2x660 MW Maitree Super Thermal Power Project on Turnkey Basis at Rampal, Dist.-Bagerhat, Bangladesh, on the bank of river Possur, Bangladesh, for the purposes of supply and sale of electric power to BPDB. Wet Limestone FGD System is also envisaged by customer in this project to control SO₂ Emissions from the power plant. For the purposes of setting up the Wet Limestone FGD System for 2x660 MW Coal fired Power project at Rampal, BHEL is inviting bids from suitably qualified Bidders for Slurry pumps, pursuant to and in accordance with these bidding documents.	
A	SITE CONDITONS	
	1. Ambient Temperature and Relative Humidity	
	a. Average Site Condition ASC	
	Ambient Temperature	: 27.3 deg C
	Ambient Humidity	: 87%
	Ambient Pressure	: 1007.6 mbar
	b. Summer Site condition SSC	
	Ambient Temperature	: 36.9 deg C
	Ambient Humidity	: 60%
	Ambient Pressure	: 1007.9 mbar
	c. Winter Site condition WSC	
	Ambient Temperature	: 12.2 deg C
	Ambient Humidity	: 100 %
	Ambient Pressure	: 1017.2 mbar
	d. Reference Site condition RSC	
	Ambient Temperature	: 31 deg C
	Ambient Humidity	: 88%
	Ambient Pressure	: 1007 mbar
	2. Design ambient conditions for Electrical Systems	



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	a.	Maximum Design temperature (outdoor)	:	45 deg C
	b.	Maximum daily average ambient shade temperature	:	38 deg C
	c.	Maximum monthly average temperature (in the shade)	:	34.6 deg C
	d.	Maximum annual average temperature (in the shade)	:	27.3 deg C
	e.	Maximum design temperature of the electrical equipment installed indoors in air conditioned rooms	:	40 deg C
	f.	Maximum design temperature of the electrical equipment installed indoors in non-air conditioned rooms	:	45 deg C
	g.	Minimum design temperature	:	0 deg C
	3.	Plant Elevation	:	+5.0 m above sea level
	4.	Wind Load	:	As per Bangladesh National Building code-2012, Part-6, Chapter 2.4
	a.	Basic Wind speed, three-second gust at 10m above ground in exposure C, having a return period of 50 years	:	73 m/s, Exposure category-"C"
	5.	Seismic Load	:	Seismic Zone 1 as determined by Bangladesh National Building code (BNBC-2012)
	Note: 1) Reference site conditions shall apply for the Guarantee Values as well as for the Guarantee test/Performance test 2) Equipment and Material must be suitable for the range of ambient site conditions. In particular the saline atmosphere has to be considered.			
B PROJECT LOCATION AND APPROACH				
	a.	State/Division	Khulna	
	b.	District	Bagerhat district	
	c.	Place	Moithara Village, Rampal Upazila	
	d.	Location	Latitude- 22 deg 37" 0" to 22 deg 34" 30"N Longitude- 89 deg 32'0"E to 89 deg 34'5"E	
C APPROACH TO SITE:				
	The nearest town Khulna is at a distance of 23 km from project site. The site is connected by road from Mangla- Khulna Highway. Nearest Domestic airport is Jessor, Bangladesh at a distance of about 107 KM and international airport is Dhaka at a distance of 263 KM, Bangladesh. The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information given above is for general guidance and shall not be contractually binding on the Owner. Bidders shall obtain clarifications/ information, if any, before submitting their offers, regarding scope of work, facilities available at sites, etc. No additional claim shall be entertained by BHEL in future, on account of non-acquaintance of above. All relevant site data/ information as may be necessary shall have to be obtained/ collected by the Bidder.			
D APPLICABLE CODES & REGULATIONS				
	The design of Elevators shall conform to the latest edition of International codes accepted by the			



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Buyer according to good engineering practice.

List of codes/standards recommended: (The list is not exhaustive)

S.No	Description	Material	Design & others
1	Piping	AISI, ASTM,ASME,DIN,EN,BS or Equivalent	AFNOR, ANSI, API, ASME, ASTM, AWWA, BS, DIN, EN, EJMA, Manufacturer's standard
2	Machinery	AISI, ASTM,ASME,DIN,EN,BS or Equivalent	AFNOR, AFBMA, AGMA, ANSI,API, ASTM, AWS,BS, DIN, IEC, HI, HEI, ISO, NEC, NEMA, EN, TEMA, VDI, Manufacturer's standard
3	Instrumentation	AISI, ASTM,ASME,DIN,EN,BS or Equivalent	AFNOR, ANSI, API, ASME, BS, DIN, EN, IEC, IEEE, ISA, ISO, NC, Manufacturer's standard
4	Electrical	AISI,ASTM,ASME,DIN,EN,BS or Equivalent	BS, VDE, IEC, EN, ANSI,IEEE, NEMA
5	Civil	AISI, ASTM,ASME,DIN,EN,BS or Equivalent	AFNOR, ASCE, ASNT, BS, DIN, EN, ANSI, ACI,AISC,AWS, SSPC, Manufacturer's Standard
6	Structural Steel	SA/IS2062	BS/EN 1993 (Eurocode-3) or Equivalent international codes.

The design, materials, construction, manufacture, inspection, testing and performance of Slurry pumps shall also comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. It is the supplier's responsibility to fully comply with the latest version of changes in regulations, codes and standards.

If there is a conflict between this specification and a referenced document or between the codes and standards the most stringent shall apply.

2.0 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 of Maitree 2x660MW project in Bangladesh. The following points may be noted.

- There are 2 units of each 660 MW and each unit is envisaged with one FGD system. There is a Limestone Grinding Building which is common for both the units. This building is envisaged with One (1) no. Rope & Pulley Type Elevator.
- 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.



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	c. The Bidder shall offer only proven design which meets the Provenness criteria indicated in the clause no: 4.0. Necessary document evidences as per Annexure-III & VI shall be submitted along with the bid. If bidder doesn't meet the specified provenness criteria, they are denied to participate in this tender. d. In case, deviations are considered essential by the Bidder (after exhausting all possible efforts), the same shall be separately listed in the Bidder's proposal under separate section, titled as "List of Deviations/Exceptions to the Enquiry Document (Annexure-IV)". e. Any deviation, not listed under the above section, even if reflected in any other portion of the proposal, shall not be considered applicable. f. No deviation or exception shall be permitted without the written approval of the purchaser. g. 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. h. 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. i. 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.
3.0	PRE QUALIFICATION REQUIREMENT (APPLICABLE IN CASE OF OPEN TENDER)
	"Bidder to have previous experience of manufacturing, supplying, erecting and commissioning the Elevators for boiler application in fossil fuel fired thermal power plants of unit rating 250MW or above 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."
4.0	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.
5.0	REFERENCE STANDARDS
	The Elevators shall be designed in line with the recommendation contained in the latest editions of applicable International Standards (EN 81-1:1998/equivalent international standard). The equipment shall comply with latest revision of International standards, codes and practices. Indian standards are not acceptable.



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6.0	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 and 240 V AC single phase 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.		
7.0	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 flooring. iv) Steel structures for Columns and associated bracings and approach platforms up to landing doors at each level.		
8.0	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 in the Limestone Grinding Building (or Wet ball Mill Building or Limestone Silo Building). The shaft area is 3.5 m x 4.0 m. 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 during contract stage.		
9.0	Design Criteria and Equipment specification for Passenger cum Goods Elevator.		
	i)	Type of service	Passenger cum Goods Elevator
	ii)	Number required	As per Annexure -I
	iii)	Load on the Elevator	As per Annexure -I
	iv)	Rated speed	1.0 meter/ sec for Passenger cum Goods Elevator.
	v)	Total travel	As per Annexure -I
	vi)	No. of floors to be served (Landing levels)	As per Annexure -I
	vii)	Entrances	One number in each floor



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	viii)	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.
	ix)	Flooring of Car	Chequered plate (6 mm thick). Car floor shall comprise of a smooth nonslip surface.
	x)	Position of Machine room	Directly above the Lift shaft
	xi)	Design, construction and finish of car	SS (ASTM-304 No: 4 Hairline finish)
	xii)	Car door	SS (ASTM-304 No: 4 Hairline finish)
	xiii)	Landing door	MS sheet fabricated, smooth finish, spray painted to approved shade.
	xiv)	Car Enclosure	SS (ASTM-304 No: 4 Hairline finish)
	xv)	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.
	xvi)	Method of operation of car	Power operated type – automatic, Horizontal Centre opening / closing car and landing doors.
	xvii)	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.
	xviii)	Signals / Indicator	Car position indicator in car, hall position indicator at all floors, Up & down travel direction position indicator, tell-tale lights at all floors. Soft touch keys and digital luminous display in car operating panel and on all floors landings. 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.
	xix)	Shaft lighting	The Elevator shaft shall be suitably illuminated by providing CFL fittings at every 3m (three metres) from bottom of Lift well.
10.0 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. In addition to the following , elevators shall meet the painting requirement as mentioned in Clause:16.0		
	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



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	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 latest international standard.
	xvii)	Safety equipment (Linkages)	Zinc-plated
	xviii)	Safety switch and car gate switch	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
	xxiv)	Rope fasteners	Zinc-passivated and chromate dipped
	xxv)	Hoist rope	Greased, Self-lubricating
	xxvi)	Governor rope	Greased, Self-lubricating
	xxvii)	Car enclosure, interior gate, car door and 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.
11.0	MECHANICAL EQUIPMENT		
11.1	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 car interior, the car doors and the landing doors shall be finished with two coats of baked enamel. All other exposed steel or cast surfaces shall be painted with one coat of suitable metal primer and two coats of machinery enamel paint. The car 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). An emergency stop		



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	switch, of manually opened and closed type, shall be provided on top of every lift car and shall be marked conspicuously". iii) A three pin plug & socket with switch on top of Elevator car for use by persons working there on.
	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.
11.2	CAR DOOR
	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 1800mm 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.
11.3	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.
11.4	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.
11.5	SUSPENSION ROPES



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	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 International Standards, Codes and practices related to – “Specification for steel wire suspension ropes for Lifts and hoists”.
11.6	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 International Standards, Codes and practices 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 International Standards.
11.7	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.
11.8	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 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.
11.9	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.
11.10	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.
11.11	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.



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11.12	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.
11.13	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.
11.14	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 International Standards, Codes and practices, 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.
11.15	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.
11.16	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 structural steel frame (by BHEL) for the elevator. 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 Machine room shall be provided with 1 no. of 2 tonne A/C unit. (minimum).
11.17	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.



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	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.
12.0	ELECTRICAL EQUIPMENT AND CONTROLS
12.1	OPERATION AND INTERLOCKS
	The operation of the Elevator shall be simplex, selective, collective, and automatic, with or without operator. The Elevator operation shall conform to the following requirements. i) The operation of the Elevator shall be through a push button station located inside the car. ii) The Elevator shall not move unless the car door, landing door and all other protected openings connected with the control circuit are closed. iii) Two push buttons, one for upward and the other for downward movement at each intermediate landing and one push button at each terminal landing shall be provided in the landing floors in order to call the car. iv) The landing doors shall be interlocked so that the landing door at any floor shall not open when the Elevator is not on that floor. v) Push button shall be fixed in the car for holding the doors open for any length of time required.
12.2	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.
12.3	ELECTRIC MOTORS
	Motors shall be designed for S4 Intermittent duty and Maximum 180 starts per hour. For Motor specification pl refer to Annexure-X-MOTOR SPECIFICATION
12.4	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.
12.5	CABLES AND INTERNAL WIRING
	For all applicable cables in Elevator pl refer to Annexure-XI-Cables Specification.
12.6	CABLING AND EARTHING
	Earthing shall be carried out as per International Codes, Standards and practices and Bangladesh 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.



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12.7 POWER SUPPLY

One three phase 415V, AC, 50 Hz UPS Supply for Elevator main motor, and one single phase 240V, AC, 50Hz supply feeders for lighting, air conditioner and control panels will be provided in the machine room by BHEL. The exact Power requirement in kVA of three phase supply and single phase power supply shall be indicated in the offer itself by the vendor. 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.

POWER SUPPLY

Bidder shall design and supply the equipment suitable for mentioned power supply condition.

1) Power Source Condition

AC	Medium Voltage SWGR		Low Voltage SWGR	
	Nominal	Range	Nominal	Range
Voltage (Steady State)	11/3.3 kV	+/- 6%	240/415 V	+/- 10%
Frequency	50 Hz	-5 to +3%	50 Hz	-5 to +3 %
Phase	3 ϕ		1 ϕ for 240V, 3 ϕ for 415V	
DC	Medium Voltage SWGR			
	Nominal	Range		
Voltage (Steady State)	220 V	-15 to +10%		

2) Power Distribution

		Voltage		Phase	Emergency Power Source	Note	
Motor	AC	11	kV	3P		≥ 1500	kW
		3.3	kV	3P		≥ 160	kW- <1500 kW
		415	V	3P		≥ 0.2	kW- <160 kW
		240 / 415	V	3P		0.2	kW and under
Power outlets for welding	AC	240	V	3P			
Power outlets for portable tools	AC	240	V	3P			
Safety power outlets	AC	240	V	3P			
Lighting Distribution	AC	240	V	3P			
Normal Lighting Apparatus	-	240	V				
Emergency Lighting Apparatus	-	240	V				
Control Voltage for							
MV switch gear	DC	220	V	1P			
Motor Control Center	AC	240	V	1P			
Supply to instrumentation services							
Normal	DC/AC	220/220	V	1P	AC is supplied from UPS.		
Emergency Unit	DC/AC	220/220	V	1P	AC is supplied from UPS.		

3) Enclosure for Electrical Equipment

S.No	Description	IP Category
1	Motors- Indoor	IP 54
2	Motors-Outdoor	IP 55
3	LV Switch gear	IP 54



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	4	Local Start Stop Push Button	IP 55
	5	Field instruments	IP 65
	6	Junction Box	IP 55
	7	Local Control Panel	IP 54
	8	Cable Connecting Box	IP 55
	9	Indoor A/C or ventilated equipment	IP 41
	10	Cable Box- indoor	IP 54
	11	Cable box-Outdoor	IP 65
	4) Design Ambient conditions for Electricals		
	S.No	Description	IP Category
	1	Maximum Outdoor Design Temperature	45 Deg C
13.0	2	Maximum Design temperature for equipments installed in A/C Rooms	40 Deg C
	3	Maximum Design temperature for equipments installed in Non A/C Rooms	45 Deg C
	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.		
	S.No	Description	
	1.	Metric unit shall be used in the drawings and in the any displays on the equipments. 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. Predicted sound pressure levels for the pump drive assemblies shall be submitted as part of the proposal data.	



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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.	Service life: Entire equipment except wearing parts shall be designed and fabricated for a minimum service life of 30 years of operation or 200,000 full load operating hours whichever is longer.
10.	Corrosion allowance: Corrosion allowance for entire equipment shall be in accordance with latest applicable international standard.
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.
14.	Skid Mount/Transportation: Equipment shall be fabricated as skid mount design as much as practical to minimize erection at the site.
15.	Two pieces of stainless steel earth lugs shall be provided with equipment diagonally. The position of earth lugs shall be shown on each GA and/or outline drawing.
16.	Provide double nuts for anchor bolts.
17.	Bidder shall provide allowable vibration level on foundation in foundation drawings and/or general arrangement drawings.
18.	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.
19.	The bidder shall have full responsibility for vibration control of the equipment train at the site and the units satisfactory performance, even if the foundation is provided by the BHEL.
20.	Bidder to quote for the Initial Spare parts (Mandatory Spares) for equipment.
21.	Bidder shall provide the mating flanges with the necessary gaskets.
22.	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.



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	23.	Bidder to provide capacity of crane or hoist required for material handling and the details of heaviest component to be handled.
	24.	The list of all Bought out items with makes and country of origin to be mentioned along with offer to be submitted.
	25.	Quality Plan to be submitted along with the offer.
	26.	During entire period of the project, the bidders shall strictly follow and adhere to the guidelines for effective Health & Safety Management. Supply of safety gears/PPE for bidder's/bidder's sub vendor personnel deputed at site for E&C, PG tests etc. shall be in bidder's scope. Also refer to Annexure-IX- Health & Safety Management Manual for complying with requirements whichever is applicable.
	27.	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.
	28.	Material of construction for all equipment/components shall be subject to BHEL/BIFPCL/BIFPCL's consultant approval during detail engineering. Accordingly bidder shall consider MOC for all equipment/component as per best engineering practice, global standard and global references.
	29.	Bidder to provide sub vendor list and Bidder shall strictly adhere to BHEL/BIFPCL 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 BIFPCL/BHEL before placing order and bidder shall submit relevant documents as per Attachment-VI-Sub-Supplier Questionnaire .
	30.	It shall be the complete responsibility of the successful bidders to obtain "Sub Vendor Approval" from BIFPCL for all equipments & 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 BIFPCL/ BHEL, the same may be replaced with another BIFPCL/BHEL approved sub-vendor only, without any price implications to BHEL.
	31.	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 BIFPCL/ BIFPCL's 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: a. Relevant Standards b. Specifications c. Approved drawings



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		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/customer's consultant along with BHEL.
32.	Minor Chipping i.e. up to 50 mm thk, micro leveling and providing shim plates for erection of equipment / item at site shall be in the scope of bidder.	
33.	During detail engineering, bidder to strictly adhere to BHEL/BIFPCL/BIFPCL's consultant drawing formats, document numbering, quality plan & FQP formats	
34.	The identification and numbering of equipment, systems, items, etc. of supply, as well as of all documents and drawings shall be in accordance with the VGB guideline RDS-PP (Reference Designation System for Power Plants - KKS system).	
35.	Complete detail engineering drawings, calculations, selection of components etc. shall be reviewed & subject to approval of BHEL/BIFPCL/BIFPCL's consultant during detail engineering	
36.	Bidder shall furnish necessary inputs & drawings of all equipment in editable Auto CAD/ MS-Word /Excel format.	
37.	During detail engineering, successful bidder shall ensure flow of drawings/documents as per schedule. Any comments from BHEL/BIFPCL/BIFPCL's consultant should be addressed timely by the bidder.	
38.	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.	
39.	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"	
14.0	PACKING AND FORWARDING	
1.	Packing shall be as per relevant clause of product packing specification – Annexure-VII-PE:TS: 888:100:A001 (Sea worthy packing)-8.4-Packing of Goods in Wooden crates/cases/Boxes-8.4.2- Cases with Lining-Packing Category IV	
2.	Cardboard containers shall be enclosed in a solid wooden container.	
3.	Equipment and process materials shall be packed and semi-knocked down, to the extent possible, to facilitate handling and storage and to protect bearings and other machine surfaces from oxidation. Each container, box, crate or bundle shall be reinforced with steel strapping in such a manner that breaking of one strap will not cause complete failure of packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while	



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		awaiting erection at the site.
4.		Equipment and materials in wooden cases or crates 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.
5.		Crates and packing material used for shipping will become the property of owner.(BIFPCL)
6.		Packaging or shipping units shall be designed within the limitations of the unloading facilities of the receiving ports and the ship will be used. It shall be the bidder's responsibility to investigate these limitations and to provide suitable packaging and shipping to permit transportation to site.
7.		Packing (tare) shall be part of the equipment cost and shall not be subject to return. The packing should ensure integrity and cohesiveness of each delivery batch of equipment during transportation. In case of equipment assemblies and unit's delivery in the packing of glass, plastics or paper the specification of packing with the material and weight characteristics are to be indicated.
8.		Each package 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
9.		Each package or shipping units shall be clearly marked or stenciled on at least two sides as follows. BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (Pvt) LIMITED 2X660 MW MAITREE SUPER THERMAL POWER PROJECT BANGLADESH EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA" In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.
10.		Each part of the equipment which is to be shipped as a separate piece or smaller parts packed within the same case shall be legibly marked to show the unit of which it is part, and match marked to show its relative position in the unit, to facilitate assembly in the field. Unit marks and match marks shall be made with steel stamps and with paint.
11.		Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied together with the shipment of materials no



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		single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained.
12.		The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed.
13.		Wherever necessary besides usual inscriptions the cases shall bear special indication such as "Top", "Do not turn over", "Care" , "Keep Dry" etc. as well as indication of the center of gravity (with red vertical lines) and places for attaching slings (with chain marks)
14.		Marking for Safe handling: To ensure safe handling, packing case shall be marked to show the following: a. Upright position b. Sling position and center of Gravity position c. Storage category d. Fragile components (to be marked properly with a clear warning for safe handling
15.		Each crate or package is 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.
16.		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 pump & accessories, BHEL item Code, Gross Weight and Net weight of Supplied items.
17.		Prior to transport from manufacturer's work to destination, components of the unit shall be completely cleaned to remove any foreign particles. Flange faces and other machined surfaces shall be protected by an easily removable rust preventive coating followed by suitable wrapping.
18.		All necessary painting, corrosion protection & preservation measures shall be taken as specified in painting schedule. Supplier shall consider the coastal environment zone which is defined as "very severe" during final finishing/shipping.
19.		Successful bidder shall furnish the detail packing /shipment box details with information like packing box size, type of packing, weight of each consignment, sequence no. of dispatch, no. of consignment for each deliverable item against each billing break up units/ billable blocks. Without these details the BBU shall not be approved during detail engineering. Also, complete billing break-up with above mentioned details shall be submitted within 10days of LOI.



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20.	All items/equipment shall be dispatched in properly packed condition (i.e. no item shall be dispatched in loose condition such that it becomes difficult to store/identify its location at site at a later stage).
21.	Cases which cannot be marked as above shall have metal tags with the necessary markings on them. The metal tags shall be securely attached to the packages with strong steel binding wire. Each piece, Skid, Case or package shipped separately shall be labelled or tagged properly.
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, Travel charges(visa), boarding & lodging charges, any other charges arising due to regulations in the site/country, etc. shall be borne by the bidder and shall be included in quoted rate.
16.0	PAINTING
	Painting Specification
1.	Surface Preparation : Blast Cleaning SA 2.5
2.	PRIMER COAT: - Zinc Epoxy - DFT= 80micron per coat - No of coats = 1. - Primer coat thickness 80 micron.
3.	INTERMEDIATE COAT: - Epoxy High Solid - DFT= 110micron per coat - No of coats = 1. - Intermediate coat thickness 110 micron.
4.	FINISH COAT: 2 Component Polyurethane Paint - DFT= 50micron per coat - No of coats = 1. - Finish coat thickness 50 micron. - Total DFT : 240 micron.
5.	COLOUR CODE (based on DIN 2403:2007-05 & DIN 5381)-Windows grey RAL 7040 for Structural Steel and RAL 5012 for Motor.



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6.	Rust preventive paint after inspection at shop floor before dispatch shall be in bidder's scope.											
7.	Corrosion protection, coating and galvanizing, painting shall be taken care by the bidder. Bidder shall submit the painting scheme during detail Engg in line with the specification and shall be subject to approval of BIFPCL/ BIFPCL's Consultant.											
17.0	SPARES,TOOLS & TACKLES											
17.1	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 used till the Commercial Operation Date (COD)/ Issuance of Provisional Acceptance Certificate (PAC) 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 equipments are energized. These start-up & commissioning spare part list shall not be included in "Initial Spare Parts List".											
17.2	FINAL SPARE PARTS LIST (RECOMMENDED SPARES)											
	Bidders shall also furnish the Final Spares Part List (i.e. recommended spares list) along with the offer. Bidder shall provide a "Final Spare Parts List" which shall comprise of all items of the Initial Spare Parts List as well as other spares required for long term routine/planned and breakdown maintenance. Bidder shall indicate all details for each item of aforesaid Final Spare Parts List, such as Bidder's/ Original equipment manufacturers (OEM's) name and location, drawings, normal delivery period, quantity, life time/ service life, Bidder's/OEM's serial numbers and price labeling according to the plant numbering code etc. The format and content of the final spare parts list shall be agreed in the basic/detailed engineering phase and shall be subject to BIFPCL's approval. Then the final spare parts list shall be submitted by the bidder to the BHEL for approval not later than eighteen (18) months prior to the Scheduled Commercial Operation Date (COD)/ Issuance of Provisional Acceptance Certificate (PAC) of 1st Unit. The bidder shall name OEM/ three (3) vendors with complete address for each of the spare parts. Bidder shall quote for the "Final Spares Part List", however it shall not be considered for L1 evaluation, but these spares items shall remain available for order anytime during the first three (3) years commencing from COD of each unit, at the initial unit prices quoted in the offer as adjusted pursuant to the indexation mechanism approved by BIFPCL/BIFPCL's consultant. However, the BHEL/BIFPCL shall have the freedom to decide at its sole discretion to purchase spare parts either from OEM (according to quoted unit price as stated above) or directly from sub-vendors or from any other source.											
17.3	INITIAL SPARE PARTS (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</td></tr><tr><td>2.</td><td>Guide roller of each type</td><td>1 Lot comprising 20% of total population or 3 nos. of type whichever is higher</td></tr></table>	S.No	ITEM	QUANTITY	1.	Friction block	2	2.	Guide roller of each type	1 Lot comprising 20% of total population or 3 nos. of type whichever is higher		
S.No	ITEM	QUANTITY										
1.	Friction block	2										
2.	Guide roller of each type	1 Lot comprising 20% of total population or 3 nos. of type whichever is higher										



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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	2 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 of each rating	1 Lot comprising 20% of the total population
11.	Limit switches of each type	3 Nos. of each type
12.	Push button	3 Nos. of each type
13.	Control device (if applicable)	3 Nos. of each type
14.	Brake motor	3 Nos. of each type
15.	Transmitters	2 Nos. of each type
16.	Switches of each type	3 Nos.
17.	Receiver	2 Nos. of each type
18.	Bearings of each type and size	2 Nos.
19.	Roller of each type	3 Nos.
20.	Worm gear spares	
a.	'O' rings	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 Sets
24.	415V Motors	
I	Bearing(DE)	1 No. of each type
II	Bearing(NDE)	1 No. of each type
III	Cooling fan of motors	1 No. of each type
IV	Terminal Block	1 No. of each type

Bidder shall quote for the "Initial 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 equipments. 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 interchangeable 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.

17.4 SPECIAL TOOLS & TACKLES:

Any special tools & tackles required for the entire equipment to disassemble, assemble



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	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.
18.0	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%. 4) Scheduled Maintenance (Minor Overhauls): Recommended intervals between maintenance outages shall be >25000 hours operation. 5) Scheduled Maintenance (Major Overhauls): Recommended intervals between maintenance outages shall be >75000 hours operation. 6) Noise level ≤85 dB (A) at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed.
19.0	WARRANTY
1.	The warranty period shall begin on the date of taking over by BIFPCL or date of issuance of the provisional acceptance certificate for the unit – 1 (23.08.2020) (whichever occurs first) and shall end after twenty-four (24) months. Provided that the successful bidder shall extend the provisions of this warranty to cover all repaired and replacement parts furnished under the warranty obligations hereunder, subject to the warranty period for the same being for a period of 24 months from the date on which replacement or renewal work is completed.
2.	In case of failure of the equipment to meet the guarantee, BIFPCL/BHEL reserves the right to reject the equipment. However, BIFPCL/BHEL reserves the right to use the equipment until new equipment supplied by bidder meets the guaranteed requirement.
20.0	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



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		operation for the BIFPCL/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 BIFPCL 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.
21.0	TRAINING	
		Successful bidder shall provide comprehensive training for BIFPCL/BIPCL's Consultant Engineering, O&M, Erection & Commissioning staffs at site covering all aspects of the Slurry pumps - Operation & Maintenance, Troubleshooting etc.
22.0	CONFLICT	
		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 BIFPCL 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.
23.0	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.
24.0	QUALITY ASSURANCE AND TESTING	



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	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/BIFPCL/BIFPCL's consultant approval. Any comments given by BHEL/BIFPCL/BIFPCL's consultant shall be incorporated by vendor for further approval by BHEL/BIFPCL/BIFPCL's consultant. iii) Elevators are subject to inspection by BHEL & BIFPCL and inspection call shall be given 15 days in advance. v) Materials can be despatched only after obtaining CHP clearance & MDCC clearance from BHEL/BIFPCL/BIFPCL's consultant. vi) Bidder to also refer Annexure-VIII –Clause no. B.0.7 w.r.t "Inspection & Testing" for "Testing during Manufacturing" (clause B.0.7.2), and "Testing at Site" (clause B.0.7.3) (which includes Erection Tests, Commissioning Tests, PG Testing, Reliability Run Test etc.)
25.0	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 BIFPCL 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 like P&IDS 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, One (1) copy of operation and maintenance manuals shall be translated into "Bangla" and provided as paper copies and in electronic format. 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.
26.0	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



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27.0 ANNEXURES

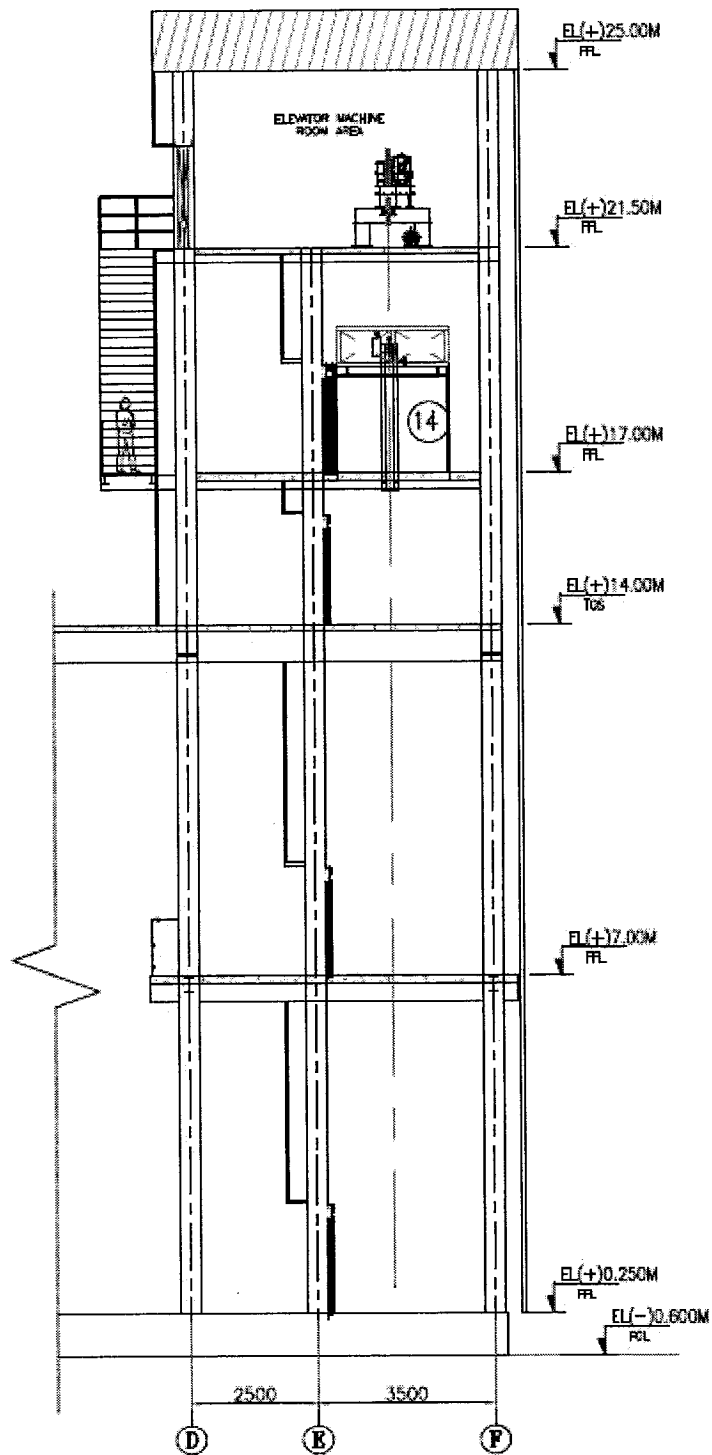
ANNEXURE I -ELEVATOR DETAILS

S. No	Building / Tower details	Elevator Type	No. of floors to be served (Landing levels)	Load on the Elevator	Total travel	Qty
1	LIMESTONE GRINDING BUILDING	Passenger Cum Goods Elevator	4 + 1 Ground Floor (For Floor Levels pl refer the dwg shown below)	1088 KG (minimum)	30 m	01 No



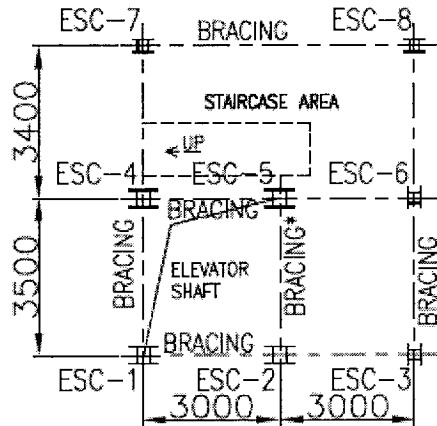
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ANNEXURE-A



PLAN VIEW OF ELEVATOR
STRUCTURE COLUMN LOCATION

**TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW****BIFPCL:MAI:FGD:ELEVATOR:R00****ANNEXURE-II****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 shall be hours	: >75000 hours operation.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



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ANNEXURE-III

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

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

Note:

1) Performance certificate (End user feedback) is mandatory for One (01) No. Reference plant

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

**TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW****BIFPCL:MAI:FGD:ELEVATOR:R00****ANNEXURE-IV****LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT**

SI No	Clause No	Page No	Description of Deviation

Note: Enlarge the table to incorporate items

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

**TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW****BIFPCL:MAI:FGD:ELEVATOR:R00****ANNEXURE-V****A) DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER:**

Sl. No.	Description	No of copies With proposal
1.	Specification	1
2.	Anchor Plan & Civil foundation Loading details	1
3.	Machine room layout (in consultation with BHEL)	1
4.	GA of Elevator with loading data	1
5.	Data Sheet	1
6.	Performance curve	1
7.	Proforma Packing List	1
8.	Shortest Manufacturing Time	1
9.	Reference plant details	1
10.	Required Electric power & other Utility List	1
11.	Deviation List	1
12.	Scope of Supply	1
13.	Start-up & Commissioning Spares	1
14.	List of Special Tools	1
15.	Delivery Schedule	1
16.	Test Arrangement & Test procedure	1
17.	Catalogue	1

B) DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:

Sl. No.	Description	No of copies After award of contract	Delivery Time
1.	GA of Elevator with loading data	1	2 weeks after contract
2.	Data Sheet	1	2 weeks after contract
3.	Installation and assembly procedure	1	4 months after contract
4.	Inspection and Test Procedure	1	1 month after contract
5.	Inspection & Test record	1	In 2 weeks after test
6.	Inspection Certificate	1	In 2 weeks after test
7.	Sub vendors List	1	2 weeks after contract
8.	Manufacturing Schedule	1	2 weeks after contract
9.	Progress report	1	Every month

**TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW****BIFPCL:MAI:FGD:ELEVATOR:R00**

Sl. No.	Description	No of copies After award of contract	Delivery Time
10.	Proforma Packing List	1	2 months prior to shipping
11.	Required Electric power	2	2 weeks after contract
12.	Motor Sizing Calculation	1	2 weeks after contract
13.	Material Test Certificates	2	In 2 weeks after test
14.	Pre Commissioning Check List	2	4 months after contract
15.	Scope of Supply	2	2 weeks after contract
16.	Quality Plan	4	1 month after contract
17.	Operation and Maintenance Manual	• 10 hardcopies and 5 electronic copies in English • 1 hardcopy and 1 electronic copy in "Bangla"	4 months after contract
18.	Start-up & Commissioning Spares	2	1 month after contract
19.	List of Special Tools	1	1 month after contract
20.	Delivery Schedule	1	2 weeks after contract
21.	Test Arrangement & Test procedure	2	1 month after contract
22.	Catalogue	2	2 weeks after contract

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW

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ANNEXURE-VI

FICHTNER'S SUB SUPPLIER QUESTIONNAIRE FORMAT

REFER FICHTNER'S SUB SUPPLIER QUESTIONNAIRE FORMAT - kindly fill the form and furnish the relevant documents to obtain vendor approval from BIFPCL. /BIFPCL's consultant along with the offer.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW

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ANNEXURE-VII

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING

Refer to Specification No: PE-TS-888-100-A001 for detailed specification on Seaworthy packing.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

ANNEXURE-VIII

INSPECTION & TESTING

Refer to all clauses for Inspection & testing requirements.

SIGNATURE OF BIDDER

NAME

DESIGNATION



TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW

BIFPCL:MAI:FGD:ELEVATOR:R00

ANNEXURE-IX

HEALTH & SAFETY MANAGEMENT MANUAL

Refer to all clauses for Health & Safety requirements.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW

BIFPCL:MAI:FGD:ELEVATOR:R00

ANNEXURE-X

MOTOR SPECIFICATION

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION OF ELEVATORS(LGS BUILDING) – MAITREE 2X660MW

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ANNEXURE-XI

CABLES SPECIFICATION

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----