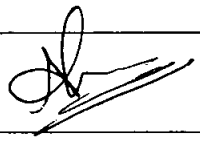
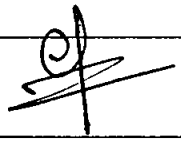
Bharat Heavy Electricals Limited

BAP/Ranipet-632406

SPECIFICATION FOR

PASSENGER ELEVATOR

REV. NO	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
00	18.10.2014	INITIAL RELEASE	**Adarsh Verma**	**M.K.Nahak**	**C. Ganesh**
					

Technical specification for Passenger Elevator

01.00.00 **SITE CONDITIONS**

01.00.01	Altitude above MSL	: Project information.
01.00.02	Relative humidity	: Project information.
01.00.03	Design Ambient Temp.	: Project information
01.00.04	Seismic Loads - Zone III	: As per latest revision of IS-1893-III/ 1984
01.00.05	Wind loads @ 10 metres above sea level	: As per IS-875(Part 3) / 1987

02. 00.00 **GENERAL:**

This specification is intended to cover the design, engineering , manufacture, inspection, testing, delivery, erection, site testing, commissioning and maintenance & services of passenger Elevator.

03.00.00 **DRAWINGS / DOCUMENTS**

The following preliminary documents/drawings should be enclosed along with the offer without which the offer will not be evaluated by BHEL.

03.00.01 Detailed description of the system offered.

03.00.02 Write-up on interlocks , controls and safety devices provided.

03.00.03 General Arrangement of Elevator, including hoist way, pit well etc.

03.00.04 General Arrangement of machine room and equipment in machine room.

03.00.05 Electrical control scheme with legend and write-up.

03.00.06 Machine room Air-Conditioning details.

03.00.07 Foundation and loading details of machine room floor and the concrete structure.

03.00.08 Manufacturing schedule.

03.00.09 Filled in vendor data sheet for Elevator, Main motor and Door operator motor.

03.00.10 Filled in vendor quality plan.

03.01.00 **The signed "Deviation format" shall be sent along with the Offer if any deviation with respect tospecification with reasons and BHEL will evaluate the offer only upon receipt of the same.**

04.00.00 **GUARANTEE**

The Elevator Vendor shall guarantee that the materials, workmanship and performance of the apparatus installed under this specification is perfect in every respect and that they will make good of any defects (not due to careless operation) which may develop within 18 months from the date of formal handing over of the equipment.

05.00.00 **MAINTENANCE**

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 ,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.

06.00.00 **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.

07.00.00 **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.

07.01.00 Civil works associated with the Elevator pit.

07.02.00 Furnishing and installation of steel beams (Hoisting beams) in the machine room, to liftequipment during installation and to facilitate maintenance.

07.03.00 Machine room civil works including concrete flooring.

07.04.00 Steel structures for Columns and associated bracings and approach platforms upto landing doors at each level.

07.05.00 Supporting steel material between hoistway & car to be provided by BHEL. Vendor to furnish the details(Bill of material--size and qty) of these materials to enable BHEL to supply the material to site.

08.00.00 **AUTOMATIC TERMINAL STOPS:**
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. Final limit switches shall be provided in the hoist way, operated by the car and arranged to stop the car and prevent normal operation, should it travel beyond the zone of the normal stopping device.

09.00.00 **SCOPE OF WORK:**

09.00.01 Design, engineering, manufacture, inspection, testing, delivery, erection, site testing, commissioning, and maintenance & services **during guarantee period.**

09.00.02 Necessary pulley block, rope and hook arrangements at the machine room ceiling to carry out the maintenance and erection of equipment shall be supplied by Elevator vendor and will be in the scope of supply. The necessary mono-rail beam will be supplied by purchaser (BHEL).Vendor to furnish the details(Bill of material--size and qty) of these materials to enable BHEL to supply the material to site.

09.00.03 A steel ladder has to be provided for access to the pit by the Elevator vendor.

09.00.04 Guard to protect the hoist way including temporary barricades at hoist way openings by Elevator vendor.

09.00.05 Scaffolding as per erection requirement shall be provided by the Elevator vendor. After completion of handing over activities, the scaffolding materials are to be taken by the vendor. Suitable provision to be made by vendor accordingly.

09.00.06 All the electrical equipment including Lift well, Hoist way & machine room lighting with fittings, Power/control/trailing cables, switch-Disconnector for 415 V AC 3 ph supply and 240 V AC single phase supply (to receive the incoming feeders provided by customer) shall be included in the Elevator vendor scope.

09.00.07 Window Air conditioner of Minimum 2 T capacity for the machine room is in vendor scope.

09.00.08 The scope shall include all items/ accessories, service along with all electrical equipments etc., required to meet all design, installation, operation, safety,

protection and other requirements of IS:14665 (Latest edition)(all parts), 'Lift' and 'Service lifts'. This scope shall include all items/ devices needed ti comply with the requirements indicated elsewhere in the specification. The scope shall include but not limited to the following:

- 1 No. of fireman's switch for each elevator.
- Machinery support beam.

09.00.09 Complete erection, testing and commissioning including all testing and commissioning materials, consumables and other tools and tackles required for erection is in the scope of Contractor.

09.00.10 Obtaining necessary local administration permits/ approval and make arrangements for inspection and tests required thereby is in the scope of contractor.

09.00.11 The supply of foundation inserts and grouting of foundation shall be in the scope of contractor.

09.00.12 All fixtures, inserts, embedments, etc. for the elevator for ESP control room shall be in contractor's scope.

09.00.13 Placements of the embedments/anchor bolts supplied by the contractor shall be done by the employer. However, the accuracy of the embedments/anchor bolts in plan and elevation shall be checked and ensured by the contractor during the placement of the same.

09.00.14 Bidder to involve during the process of concreting and also the bidder to check the accuracy/ correctness of the embedments during concreting. start of concreting to be informed to the bidder in writing by the employer. Bidder and Employer to sign a joint protocol within 24 hours after completion of the casting work involving accuracy of embedments. This shall ensure timely corrective action, if any, before complete curing of the concrete. In case of non compliance of the above, any modification required on any of these embedments/ anchor bolts cast with the foundation shall be done by the bidder.

09.00.15 Bidder shall carryout the necessary modification on these embedments/anchor bolts in case any change is required at the later date.

10.00.00 **POWER SUPPLY:**

One three phase 415V, AC ,50 Hz, power supply will be provided in the machine room by NTPC. The Vendor has to distribute the 415 V Power supply and 240V/110V AC requirement for A/C light, controls, etc. shall be arranged by vendor through Control Scheme in Vendor's Control panel.

Make of motor, control schemes, & control components are subjected to NTPC's approval.

The junction box having switch Disconnector /MCBs 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.

Further the Elevator vendor shall tap the supply with necessary isolator, switch/MCB units and distribute the power supply to the Elevator equipment and hoist way lighting.

a.	Lift operation &	415V, 3 phase, 50 Hz 3 wire supply
	Variation in	i. Voltage : ± 10 % ii. Frequency : ± 5 %
b.	Lighting, fan	240 V, single phase, 50 Hz supply
	Variation in	i. Voltage : ± 10 % ii. Frequency : ± 5 %

The vendor shall arrange to tap power supply required for constructional purposes from the point terminated by the owner. The exact Power requirement of 3 phase supply and single phase power supply shall be indicated in the offer.

NOTE:

Vendor has to confirm Power Supply requirement as given below:
I. 3 Ph , 3Wire 415 V , 50 Hz AC :
(Max. 3 Ph Power shall be 20 KW)

II. 1 Ph , 240 V , 50 Hz , AC :
a) Lighting for Hoist way , Car & Machine Room:
b) A/C Machine :

c) Controller: (Max. 1 Ph Power shall be 10 KW)

11.00.00 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, the Elevator components shall be given special corrosion treatment as indicated below.

Item no.	Description	Special Treatment
11.00.01	Cars & Counter weight	Anti-corrosive epoxy paint
11.00.02	Fish plates	Anti-corrosive epoxy paint
11.00.03	Car & Counter weight buffer	Anti-corrosive epoxy paint
11.00.04	Supports(Buffer)	Anti-corrosive epoxy paint
11.00.05	Rail Brackets	Anti-corrosive epoxy paint
11.00.06	Bracket & rail fasteners	Zinc-passivated with epoxy painted or Equivalent.
11.00.07	Tie down bolts	Zinc-passivated with epoxy painted or Equivalent.
11.00.08	Machine	Anti-corrosive epoxy paint
11.00.09	Brake adjusting screw & coupling fasteners	Zinc-passivated or Equivalent.
11.00.10	Bracket	Anti-corrosive epoxy paint
11.00.11	Controller cabinet	Anti-corrosive epoxy paint as per industry standard.
11.00.12	Hall buttons	Dust-proof with aluminium face plate or stainless steel hardware.
11.00.13	Car operating panel	Dust proof stainless steel plate and hardware.
11.00.14	Governor	Cover and casting epoxy painted. Other components zinc plated.

11.00.15	Governor Tension frame	Hot dip galvanised or Equivalent. and anti-corrosive epoxy paint with M.S. shaft for sheave.
11.00.16	Car frame, level brace rods and counter weight frame	Epoxy paint as per IS-1477
11.00.17	Safety equipment (Linkages)	Zinc-plated or Equivalent.
11.00.18	Safety switch and car gate switch	IP-65. Dust proof heavily zinc plated arm or Equivalent, stainless steel shaft and housing as per vendor standard.
11.00.19	Guide shoe	Zinc-plated or Equivalent.
11.00.20	Cam bar mountings and channels	Zinc-plated and anti-corrosive epoxy paint or Equivalent.
11.00.21	Counter weight frame	Anti-corrosive epoxy paint
11.00.22	Guide shoe with Nylon ribs	Zinc-plated or Equivalent.
11.00.23	Filter weights	Anti-corrosive epoxy paint
11.00.24	Rope fasteners	Zinc-passivated and chromate dipped or Equivalent.
11.00.25	Hoist rope	Greased after galvanising or Equivalent.
11.00.26	Governor rope	Greased after galvanising or Equivalent.
11.00.27	Car enclosure, interior gate, car door and landing door	Anti-corrosive two coats baked enamel paint
11.00.28	Alarm and door open bells (Electronic hooter)	Painted.
11.00.29	Junction box	Metallic body - dust proof with Anti-corrosive epoxy paint
11.00.30	Hall position indicator and car position indicator	Dust proof wth stainless steel enclosure and Face plate.

The Lift shall be designed to meet the latest applicable requirements of all local Lift acts and rules.

12.00.00 **MACHINE ROOM AIR CONDITIONING:** Machine room shall be provided with minimum 2 nos., of 2 tons capacity A/C units to make the machine room dust proof. **Vendor to indicate the power consumption of A/C units.**

13.00.00 **ELEVATOR PARTICULARS & DESIGN PARAMETERS**

13.00.01 Passenger cum goods & passenger Elevator shall be provided with 1 no. fireman's switch (Alarm Switch).

13.00.02 The Lift shall be located on the side of the ESP Control room as indicated in the plant layout drawing. Entry to the Lift shall be from the side parallel to boiler axis.

13.01.01 The Lift shall be designed in line with the recommendation contained in the latest editions of Standards **IS:14665:2000 (All Parts)**-'Specification of Electric Passenger and Goods Lifts', 'Codes of practice for Installation, Operation, Maintenance of Electric Passenger and Goods Lifts' and 'Outline Dimensions of Electric Lifts'.

13.02.00 **Design Creteria and Equipment specification for passenger cum goods Elevator & passenger Elevator**. Vendor should ensure the design of the offered elevators are in line with the NTPC Technical specification Amendment 1 to ,Section-VI Technical Specification Document No. CS-9548-104-2 AMDT-02

13.02.01	Type of service	Passenger Elevator
13.02.02	Number required	1 no/ boiler
13.02.03	Load on the Elevator	**588kgs(Equivalent to 8 persons)**
13.02.04	Rated speed	**1.0 MPS**
13.02.05	Total travel	**11.5mtrs**
13.02.06	No. of floors to be served	**Four(4)**
13.02.07	Entrances	**As per drawing : 9548-000-POE-F-0122-SK1**
13.02.08	Entrances and Platform size	**As per IS 14665-2000.**
13.02.09	Landing levels: floor to be served	**As per drawing : 9548-000-POE-F-0122-SK1/ 4-89-616-00515**
13.02.10	Drive Motor	Two speed AC Motor **or single speed AC motor as per IS 325 &**

		IS 14665-2000. Motor should be in line with the NTPC specification Amendment 1 to , Section-VI Part -B Sub Section - II: E6
13.02.11.	Method of control	**Motor Speed Control:** Variable Voltage variable frequency (VVVF) control for Single speed motors. **should be in line with the NTPC specification Clause 5.00.00** **Logic Control:** Relay logic control or Microprocessor Control with automatic level adjustment. **The control system shall be of field proven design and having satisfactory track record.**
13.02.12	Flooring of Car	Vitrified ceramic tile of matt finish.
13.02.13	Position of Machine room	Directly above the Lift shaft
13.02.14	Design, construction and finish of car	MS sheet fabricated , smooth finish, spray painted to approved shade.
13.02.15	Lighting and fan in the car	One cabin fan and two nos. of 20 Watts, recessed fluorescent lamp fitting for operation on 240 V, 50 Hz, AC single phase power supply
13.02.16	Car entrance and landing door	**Shall be as per IS 14665-2000**
13.02.17	Method of operation of car	Power operated type – automatic, Centre opening / closing car and landing doors.
13.02.18	Operation of Lift	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.
13.02.19	Signals	Car position indicator in car, hall position indicator at all floors, telltale lights at all floors, battery operated alarm bell and emergency light with suitable battery and battery charger and controls.
13.02.20	Shaft lighting	The Lift shaft shall be suitably illuminated by providing the fittings at every 3m(three metres) from bottom of Lift well.

Fittings type : 60 W Bulk head fitting with bulb, conduiting , pull boxes, wiring, switches, other components / accessories and necessary switches. **The make of the fittings & accessories shall be indicated in the offer.**

Note: Whenever levels, elevations/ locations are specified, the same shall be subject to confirmation after the award of contract.

13.02.21 Foundation plan and elevation with landing levels shall be as per purchaser (BHEL) drawings.

14.00.00 **MECHANICAL EQUIPMENT:**

14.00.01 **LIFT 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 or other suitable paint as approved by the purchaser. 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:

a) Car control station with position indicator inside the car and at landing platforms.
b) An emergency stop switch.
c) A three pin plug & socket with switch on top of Lift car for use by persons working there on.

d) Telephone instrument shall be provided inside the car and shall be connected to plant network.

Adequate lighting and ventilation shall be provided in the Lift car. The car shall be fitted with fan of adequate capacity. The car shall be fitted with fan smooth on slip surface. The car platform shall be robust in construction and elegant in appearance.

The car shall be provided with an emergency alarm push button inside the Lift 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.

14.00.02 **CAR DOOR:**

The car door shall be of hollow metal construction 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 under any circumstance be opened unless the Lift car is within a particular landing zone. Conversely the Lift shall not move until all the landing doors are closed and interlocked properly.

Width of Car Entrance shall be as applicable to meet the capacity of the offered elevator i.e. 588kgs (Equivalent to 8 persons).

The live load coming into play 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.

14.00.03 **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 Lift 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 Lift enclosures. Car, Car/landing door shall be of SS 304 sheet with thickness (min) 1.5mm.

14.00.04 **LOAD PLATE:**

A load plate displaying the rated load of the Lift in terms of persons and kilograms shall be fitted in the car in a conspicuous position.

14.00.05 **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 Lift 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 10. The suspension ropes shall conform to latest edition of IS 2365 -" Specification for steel wire suspension ropes for Lifts and hoists" or equivalent International Standards.

14.00.06 **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 steel to IS 1030 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.

14.00.07 **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.

14.00.08 **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 Lift and shall be in accordance with Indian Standard referred earlier 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. It should preferably be equal to that of the car weight plus 40 % of the rated load. The traction should be such that no appreciable slip may occur but that slip shall free to take place upon the landing of either the car or the counter weights.

14.00.09 **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.

14.00.10 **BUFFERS:**

Sufficient number of buffers of spring loaded type shall be fitted below the Lift 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 Lift equipment. The number of buffers shall be so fixed as to ensure proper sharing of the impact loads by all of them.

14.00.11 **EMERGENCY SAFETY DEVICES AND BRAKES**:

The Lift shall be provided with safety device attached to the Lift car frame and placed beneath the car. The safety device shall be capable of stopping and sustaining the Lift car up to governor tripping speed with full rated load in car. The application of the safety device shall not cause the Lift 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.

14.00.12 **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 Lift car or counter weight in the event of over run. Each governor shall be marked with tripping speed in terms of a car speed in m/sec and the motor control and brake control circuit shall be opened before or at the time the governor trips. Governor ropes shall not be less than 8 mm in diameter and shall be of steel or phosphor bronze and of suitable construction. The ropes shall run clear of the governor jaws during normal operation of the Lift. The Governor has to be compatible for operation with microprocessor based control system or resistance based control system.

14.00.13 **LEVELLING DEVICE**:

The Lift 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.

14.00.14 **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 Lift drive controller and all other apparatus and equipment of Lift 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 Lift 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.

14.00.15 **TERMINAL STOPPING AND FINAL LIMIT SWITCHES:**

The Lift shall be equipped with upper and lower normal terminal limit switches arranged to stop the car automatically within the limit of the top car clearance and bottom run by from any speed attained in normal operation. Such limit switches 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 limit switches. 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 Lift car has been moved by a hand operating mechanism within the limits of normal travel.

14.00.16 **INDICATORS:**

The Lift shall be provided with position indicator and call indicator inside the Lift car to show the position of the Lift car with reference to the floor numbers and the landing from which the call is being received. Up and down travel direction and position indicators shall be of standard construction.

14.01.00 ELECTRICAL EQUIPMENT AND CONTROLS:

14.01.01 OPERATION AND INTERLOCKS:

The operation of the Lift shall be simplex, selective, collective, automatic, with or without operator. The Lift operation shall conform to the following requirements.

a) The operation of the Lift shall be through a push button station located inside the car.

b) The Lift shall not move unless the car door, landing door and all other protected openings connected with the control circuit are closed.

c) 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 shall be provided in the landing floors in order to call the car.

d) The landing doors shall be interlocked so that the landing door at any floor shall not open when the Lift is not on that floor.

e) Push button shall be fixed in the car for holding the doors open for any length of time required.

14.01.02 LIFT DRIVE:

The Lift drive shall be equipped with automatic electro-hydraulic thruster brakes. The Lift 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.

14.01.03 ELECTRIC MOTORS:

Motor shall be provided as per the **Annexure-4 to amendment No.1 to Section:6,NTPC Technical Specification Document no. CS-9548-104-2-Amdt-02, clause 2.00.00.**

14.01.04 CONTROLLERS:

The controllers shall be designed to start, accelerate, stop and reverse the Lift 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 Lift controls shall be housed in dust and vermin proof enclosures. The controls shall be wired with stranded copper conductor cables. All equipments mounted shall be neatly labelled as per wiring diagram. Ventilating louvres are to be provided in the panels.

The electrical controllers shall be provided with enclosure conforming to IP-54. The contactors, relays, resistors etc. used in the total system shall be of open type construction and design. **Vendor shall furnish the size of controller panel (Length x Depth x Height) with out fail in the offer.**

14.01.06 **CABLES AND INTERNAL WIRING:**

All Cables and wirings shall be supplies as per the **Annexure-4 to amendment No.1 to Section:6, NTPC Technical Specification Document no. CS-9548-104-2- Amdt-02, clause 5.00.00.**

14.0107 **CABLING AND EARTING:**:

Earthing shall be carried out as per IS 3043 and Indian Electricity Rules. The Lift 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 Elevator vendor shall provide 25 x 3 mm GI flat for control panel and 50 x 6 mm GI flat earth bus in the machine room and connect all earth points to the same. The earth bus will be connected to the station earth mat by the owner.

15.00.00 **OTHER REQUIREMENTS:**

15.00.01 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. Necessary lockable switches shall be provided in the Lift machine room to control the operation of the door. Should the electric power fail, it must be possible for the doors to be manually opened from within the car.

15.00.02 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 Lift equipment from phase reversal, low voltage.

15.00.03 A complete set of special tools and tackles required shall be supplied along with Lift. 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, which is part of scope of supply).**

15.00.04 **SPARES:**

The vendor shall furnish the List of commissioning, start up , mandatory and recommended spare parts and include separately in the offer with item wise price in the schedule of spare parts. Purchaser reserve the rights to finalise the quantities of spare parts and effect price adjustment on the basis of unit rates quoted. The spares ordered by the purchaser shall be delivered at site to suit the commissioning of the respective units. The vendor shall indicate in the schedule of spare parts the delivery period from the date of acceptance of the offer for the spares. The vendor shall also indicate in the schedule of spare parts, the details of fast, slow and medium moving spares.

The spares recommended above with unit prices shall be atleast for three years normal consumption for operation of the plant. The vendor shall also indicate the service expectancy for these spare parts under normal operating conditions before the replacement is necessary.

All the spares supplied under this contract shall be strictly interchangeable with the parts for which they are intended for replacement. The spares shall be treated and packed for long storage under the climatic conditions prevailing at site (e.g.) small items shall be packed in sealed transparent plastic bags with dissector packs as necessary. Each spare part shall clearly be marked or labelled on the outside of the packing in single case. The general description of the contents shall be shown on the outside of such cases. All cases, containers and other packages shall be marked suitably and numbered for the purpose of identification.

All cases, containers and other packages are liable to be opened for such examination as may be felt reasonable by the purchaser. The vendor shall bear in mind the shipment of the plant having ball or roller type bearings for which the following special provisions shall apply:

i) If temporary transit bearings are fitted to such plant, then, additionally, two complete sets of service bearings shall be included and shipped with such plant.

ii) If the item of the plant is shipped with service bearings in position, then additionally one complete set of service bearings shall be included and shipped with such plants. In either or both of the above provisions, the cost of the additional sets of bearings shall be included in the offer.

iii) If replacement of any bearing is required due to damages during shipment or other causes, the spare bearings shall be used to replace at free of charge.

iv) Vendor has to submit the spares list which should include all the listed items in the **Annexure-I to Amendment No.1 to Section-VI , NTPC Technical Data Sheet passenger elevator for ESP control room.**

Vendor should submit spares with Quantity, Unit, Unit Rate, Total Price for the offered spares, where items are not applicable for the offered lift the same shall be indicated as NOT APPLICABLE. Also any other requirement for the successful operation of the offered lift shall be included.

The price of spares will have to be kept optional. As & when requirement arises the same will be utilised by BHEL.

16.00.00 **ACCEPTANCE:**

After erection, the performance of the Lift shall be tested for ascertaining the conformity with the specification and upon satisfactory completion of the tests, the Lift will be taken over. **The responsibility for obtaining commissioning and handing over protocol signed by the customer lies with the Elevator vendor.**

17.00.00 **QUALITY ASSURANCE AND TESTING:**

17.00.01 a. Vendor shall prepare Quality plan in the NTPC Reference Quality Plan format(copy enclosed). Such a QP shall be discussed by the vendor with NTPC/QA/Noida/Delhi and obtain approval for the same for a fixed period of time.

b. For the required projects, such a NTPC approved Reference QP shall be submitted by the vendor to BHEL after order placement to get specific approval for the relevant project from NTPC/QA through an endorsement form.

c. The RQP(Reference Quality Plan) shall be prepared based on QP approved by NTPC earlier .

d. Elevators are subject to inspection by BHEL & NTPC and inspection call shall be given 15 days in advance.

e. Materials can be despatched only after obtaining CHP clearance & MDCC clearance from NTPC.

f. QP shall contain the type test requirements as per relevant standard and vendor shall submit type test certificates carried on similar type and valid within 5 years from the date of enquiry.

Vendor has to give compliance for the above requirement.

18.00.00 DOCUMENTATION:

18.00.01 Within 15 days from the date of LOI, all the final Drawings / documents shall be submitted.

18.00.02 No. of copies of drawings and documents to be submitted after award of order shall be as follows.

SL.NO	DESCRIPTIONS	NO. OF PRINTS	NO.OF CD ROMS
01.	Drawings for " Approval"	10	---
02.	Drawings for " information"	10	---
03.	Drawings " Final Drawings"	17	3
04.	Drawings " As Built "	17	3
05.	Data sheets & other type of documents	17	3
06.	Operation & Maintenance manual - " Draft "	2	---
07	Operation & Maintenance manual-"Final "	20	3
08.	Test certificates / reports	8	---
09	Completion report	8	---

Details of Elevator requirements Passenger Elevator

Sl.no.	Design requirement	Basic	Capacity	Height	Speed in MPS	Remarks
1	No. of Landing levels	4	588	11.5Mts	1.0	As per the enclosed drawing and technical specification.

As per drawing :9548-000-POE-F-0122-SK1/ 4-89-616-00515

2. The major components of lift with weight details to be indicated by the vendor in the offer itself.

3. Motor for the 588 kg to be indicated separately.

4. Lift rope with accessories per Metre to be quoted.

5. The Lift Well dimensions shall be in line with the NTPC civil drawing applicable for LARA Stage-I project.

6. Fire Resistant Landing doors only

7. Mimic Diagram is in the scope of supply.

8. Any other steel works as well as other accessories/components not specified in the specification but necessary for making the elevator complete are in the scope of supply of the vendor.

9. Inspection by BHEL & NTPC.

10. Functional Guarantee test shall be carried out at site for over speed test, travel and hoist speed checks.

11. Panoramic type elevator shall be either capsule type or 5 sided glass panel as per the customer requirement.

12. Bidder shall fill the electrical load data for each project separately.

13. Min dimensions as specified in applicable IS 14665 (all five parts) shall be considered/provided for lift shaft/pit/car/ M/c Room. Safety requirement shall be as per IS 14665 (Relevant part).

14. Equipments/facilities needed for erection commissioning shall be in bidder's scope. Make of various bought out items & QAP shall subject to approval of BHEL / Customer i.e. NTPC.

15.Bidder shall provide all required spares during E & C without any commercial implication.

16. All Landing door shall be fire rated for at least 1 Hour.

****

List of Spares to be offered by the vendor.

Annexure –I to Amendment No. 1 to SECTION-VI

Ref clause 15.00.04 OF TEP Page 19/39

r. Passenger Elevator for ESP Control Room	
1. Friction block	2 nos. of each type
2. Guide roller of each type	20% of total population or 3 nos. whichever is higher
3. Contactors	2 nos. of each type and rating
4. Bushing (for door front)	2 sets* of each type
5. Pinion	2 nos. of each type
6. Worm gear spares of each type	
6.1 'O' rings	4 sets *
6.2 Sealing ring of each type	4 sets *
7. Time device/Timer card(as applicable)	2 nos. of each type and rating
8. Rectifiers	2 nos. of each type and rating
9. Resistor (if applicable)	3 nos. of each type and rating
10. Fuses/MCB/Switches (as applicable)	2 nos. of each type & rating
11. Limit switches	3 nos. of each type and rating
12. Push button	complete replacement of one elevator
13. Contact device (if applicable)	3 nos. of each type and rating
14. Brake motor/ magnet(as applicable)	1 nos. of each type and rating
15. Bearings	2 nos.of each type & size
16. Magnetic coil	3 nos.
17. Floor indicator Display unit	1 nos of each type

* One set means one complete replacement for an equipment

1.05.05 Normally, Rapper Panels are housed in ESP Control Room. However, Rapper Panel rooms on ESP roof for Rapper Panels are also acceptable provided contractor has proven experience on satisfactory performance of such arrangement. In such case Contractor should provide the following :

a) Rapper panel rooms as per contractor's requirement.

b) Rapper panel rooms should be fully air conditioned, leak and dust proof.

c) One number Passenger elevator of minimum capacity (408 Kg) per unit should be provided to Rapper panel room. All works related to the elevator shall be in the scope of the Contractor.

d) The machine room for the elevator shall be dust proof and shall be provided with an air conditioner of suitable capacity.

In such case, Cable tray and support system for the NTPC cables to rapper controllers. Elevators, Hoists & air conditioner shall be under the scope of Bidder. Further, in such case, complete civil works including Elevator Shaft, Machine Room for ESP Rapper Panel Room Elevator, its cladding sheet etc. shall be in Contractor's scope. General Arrangement and loading data for the same shall be provided by the contractor.

Complete erection, testing and commissioning including all testing and commissioning materials, consumables and other tools and tackles required f or erection shall be in the scope of Contractor.

Obtaining necessary local administration permits /approvals and make arrangements for inspection and tests required thereby shall be in the scope of Contractor.

Specification of the Elevator for Rapper Panel rooms shall be as per Cl. 13.00.00, Sub-Section I:M, Part B, Section-VI of Technical Specification. Specification of Elevator Electricals shall be as per Sub-Section II:E6, Part B, Section-VI of Technical Specification.

The machine room for the elevator shall comply with the following:

a) Pre-Fabricated Insulated Metal Sandwich panel for Wall Cladding
Supplying, fitting & fixing in position at all levels, high tensile Prefabricated Sandwich Panel of Double Skin Insulated Metal Cladding, comprising of minimum 50 mm thick insulation of Rock wool of minimum density 48 kg. / cu.m conforming to IS: 8183 or Polyurethane Foam (PUF) of minimum density 48 kg/cu.m and thermal conductivity of maximum 0.023W/m.deg. K between two skins of 0.5 mm bare metal thickness (metal thickness excluding thickness of coating & painting), and minimum yield strength of 340MPa, coated with Zinc Aluminium alloy (Zincalume) at the rate of 150gm per sq. m. conforming to AS: 1397/ class 4, ASTM A653M/ EN 10326. The outer sheet of Sandwich Panel shall be troughed (of approved profile) permanently colour coated sheet with the exposed outer surface finished with total coating thickness of 25 microns (nominal) dry film thickness (DFT) consisting of Silicon Modified Paint or Super Polyster paint of 20 microns (nominal) over 5 microns (nominal) primer coat and the inner sheet shall be plain sheet of approved profile & shade with exposed side finished with permanently colour coating of 25 microns consisting of Silicon Modified Paint or Super Polyster paint of 20 microns (nominal) over 5 microns (nominal) primer coat.

Annexure –2 to Amendment No. 1 to SECTION-VI

Windows/ventilators shall be of standard extruded Anodised Aluminium Sections of minimum 2 mm thickness with 24 mm hermitically sealed double glazing consisting of two 6 mm thick toughened glass separated by 12 mm. gap.

Technical requirements of insulated sandwich panels/decking sheets shall be same as given elsewhere in this specification.

Inner face of both outer and inner sheets shall be provided with primer coating of minimum 5 microns (nominal). (SMP/ Super Polyster paint shall conform to Product Type 4 of AS / NZS2728 and the primer coat.

Sandwich Panels shall be fixed on to the supporting steel runners with special colour coated fasteners conforming to corrosion resistant Class 3 of AS : 3566 and tested for 1000 hours salt spray test.

b) Pre-Fabricated Insulated Metal Sandwich Panel For Roofing

Supplying, fitting and fixing in position at all level Metal faced Insulated Sandwich panels for roofing, laid to specified slope, consisting of Bottom & Top sheet of Troughed Permanently Coloured coated sheets of approved profile & shade, of high tensile steel, having minimum yield of 340 Mpa of 0.5 mm thickness (bare metal thickness i.e. metal thickness excluding thickness of coating & painting) and coated with Zinc Aluminium alloy (Zincalume) at the rate of 150gm per sq.m. conforming to AS: 1397/ class 4, ASTM A653M/ EN 10326. The outer exposed face of the sheets shall be permanently colour coated with total coating thickness of 25 micron (nominal) dry film thickness (DFT) comprising of Silicon Modified Paint (SMP with silicon content of 30% to 50% paint) or super polyester paint of 20 micron (nominal) over 5 micron (nominal) primer coat, and the inner face of the sheets shall be colour coated with total coating thickness of 10 micron (nominal) dry film thickness (DFT) comprising of SMP, with silicon content of 30% to 50% or super polyester paint of 5 microns (nominal) over 5 mm micron (nominal) primer coat (SMP & super polyester paint shall confirm to product type 4 of AS/NZS2728).

The insulation between the sheets shall be minimum 50mm thick Mineral Wool conforming to IS: 8183, of minimum density 32 kg / cu.m for glass wool or 48 kg / cu.m for rock wool.

Sheets shall be of approved profile, sectional properties (suitable for specified loading / deflection and purlins / runners spacing), color & shade and the item shall include all labour, materials , equipments, handling, transportation, special coated self drill fasteners for sheet fixing, special coated Z spacers for insulation fixing & clip fixing, and special coated clips for clip lock system (special coating conforming to corrosion resistant class 3 of AS 3566 and tested for 1000 hour salt spray test).

c) Machine Room

Floor of Machine Room shall be provided with profiled metal decking sheet. Trough shall be filled with Insulating Material (glass wool or rock wool) and thereafter finished with Minimum 50 mm thick wooden flooring, consisting of 37 mm thick hardwood planks, finished with 11mm thick laminated wooden flooring (of 'pergo' or equivalent) with plank size 193x1195mm (material class shall be 34 as per EN13329), over 2 mm expanded polystyrene foam and polythene sheet under laying.

Roof and Side enclosure of Machine Room shall be provided with Prefabricated Insulated Metal Sandwich panels

Doors of Machine Room shall be Double Plate Steel flush doors of thickness 45 mm with steel sheets of 18 gauge with necessary stiffeners. Space between two sheets shall be filled with mineral wool. Frame of doors shall be pressed steel sheets of 16 gauge. All necessary fittings for the doors shall be provided by the Bidder. Rubber sealing, for making the Doors airtight shall also be provided.

Annexure –3 to Amendment No 1 to SECTION-VI

13.00.00 **PASSENGER ELEVATORS FOR ESP CONTROL ROOM**

13.01.00 **Design Criteria and Operational Specification**

13.01.01 **Design**

Elevator shall be of conventional enclosure type for ESP building. The elevator shall meet the quality of international standard. The quality of glass panel on rear should be of highest grade from safety point of view and should meet the best standard.

13.01.02 No. of floors to be served shall be as per the specification of the Employer. Bidders shall quote variation in price for addition/deletion of one landing level in the relevant schedule of Forms and Procedures. However, bidder shall quote for above indicated landing levels in his base offer. No of floors and landing elevations are tentative only. The final landing elevations for all buildings shall be subject to approval by the Employer after award.

13.01.03 Elevators shall be designed based on following criteria:

i)	Design/construction/installation codes.	:	Latest edition of IS: 14665 (all parts)
ii)	Load carrying capacity	:	Equivalent to 8 persons for passenger elevator for ESP building.
iii)	Rated speed	:	1.0 m/sec.
iv)	Position of machine room	:	Directly above the elevator shaft.
v)	Machine room	:	Machine room shall be provided by NTPC. However window air conditioner of minimum 2T capacity per elevator shall be provided by Contractor.

13.02.00 **Construction**

Construction of the elevators shall specifically meet all requirements of the codes indicated and shall have following additional features:

i)	Flooring of Cabin	:	Vitrified ceramic tiles of mat finish.
ii)	Car enclosure & car panels	:	Stainless Steel
iii)	Handrails on 3 sides		Mirror Stainless Steel
iv)	False ceiling		Powder painted
v)	Car opening & Hoist way opening		Protected by central opening sliding Stainless Steel door

1. AUTOMATIC RESCUE DEVICE (ARD)-(BATTERY DRIVE) :

Contractor to provide a modern Advanced electronic drive system of "RESCUING Passenger Trapped in a ELEVATOR".

2. EMERGENCY SAFETY DEVICES :

The lift shall be provided with safety Device attached to the lift car frame and placed beneath the car. The safety device shall be capable of stopping and sustaining the lift car up at governor tripping speed with full rated load in car.

13.02.01 All steel embedment for fixing landing doors/indicators etc. to the Elevator well shaft and fascia plate shall be supplied by the Contractor.

13.02.02 Guide rails complete with supporting brackets for the car and counter weights.

13.02.03 Elevator drive machines complete with electric motor, reduction gear unit, suspension ropes, buffers for the cars and the counter weights and other drive and control mechanism. All foundation anchor bolts, sleeves, anchoring steel and any item required to complete the job satisfactorily shall be provided by the Contractor. The Contractor shall also provide for the grouting of anchor bolts, sleeves, anchoring steel, etc. and other anchorages. Contractor shall provide hoist and hoisting beam in the machine room ceiling.

13.02.04 Any other steel works as well as all other accessories/components not specified in the specification but necessary for making the Elevator complete.

13.02.05 All minor building work including the supply of steel items, associated with installation of equipment in the machine room hoist way, hoist way door, frames and Elevator pit, shall form part of Contractors scope of service, owner will provide the Elevator-well complete with foundation and brick walls around the lit-well together with overhead machine room. The machine room will be provided with R.C.C. floor slab with necessary pockets for anchor bolts and slots.

13.03.00 **Operation**

13.03.01 Elevator shall have provisions to meet following operational requirements :

a) Door operating shall be automatic door operation and electronic door protection system for opening/closing of car and landing doors.

b) Contractor shall provide 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.

c) Contractor shall provide emergency indicator to indicate the location of elevator in case of elevator being stuck up between the floors through automatic flashers (both audio & visual)

d) Contractor shall provide electronic door detector (Infra red curtain type).

e) Two push buttons, one for upward movement and the other for downward 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 Contractor.

f) All fixtures shall be in stainless steel face plates.

g) Push buttons shall be fixed in the car for holding the doors open for any length of the time required.

h) All other safety/protection/operation interlocks as required by IS:14665 (latest edition).

DATA SHEET

i)	Type of services	:	Passenger
ii)	Load carrying capacity	:	588 KG (for 8 persons)
iii)	Rated speed		One (1) meter/second
iv)	Total Travel	:	11.0M
v)	No. of floor to be served	:	Four (4) Nos.
vi)	Method of control	:	Variable voltage variable frequency (VVVF)
vii)	Position of M/c room	:	Directly above lift shaft
viii)	Size of platform	:	As per IS14665 & manufacturer's standard latest.
ix)	Size of lift well	:	-do-
x)	Specification code	:	As per IS:14665 (5 parts) (Latest Edition).
xi)	Design seismic co-efficient	:	According to the IS 1893-1977

PART - B
SUB SECTION - II:E6
ELEVATORS (ELECTRICALS)

ELEVATORS (ELECTRICALS)

1.00.00 CODES AND STANDARDS **IS:4722, IS:325**

2.00.00 Electric motor:

The driving motors shall conform to IS 325 and suitable for the Variable Voltage Variable Frequency (VVVF) application. All motors shall be squirrel cage induction type, suitable for operation at 415V (+/- 10% variation) , 3 phase, 3 wire, 50HZ (+3% to -5% variation) supply. Motors shall be provided with **thermal class 130 (B) or better insulation.**

3.00.00 CAR ELECTRICAL ACCESSORIES The following accessories shall be provided :

i) Recessed fluorescent light fittings for illumination level of 100 lux on car floor.
ii) Portable light and alarm bell with battery and charger ventilation fan with control.
iii) Car control station with position indicator inside the car and at landing platforms.
iv) Emergency stop switch.
v) 5/15A, 3 pin plug socket with switch on top of lift car.
vi) Hand free speaker telephone set connected to plant network.

4.00.00 POWER SUPPLY

Each elevator shall be provided with a separate three phase, three wire 415V feeder of adequate rating.

5.00.00 Controls:

The controls shall be Variable Voltage and Variable Frequency type and shall provide smooth and constant acceleration and retardation under all conditions of operation. Suitable control panel shall be provided in the machine room.

6.00.00 Cables and wiring:

All the cables except trailing cables shall be as per IS:1554-1 or IS-7098-I. the PVC outer sheath of these cables shall be flame retardant, low smoke (FRLS) type with the following FRLS properties.

a) Oxygen index of min. 29 (as per IS:10810 Part-58)

b) Acid gas emission of max. 20% (as per IEC-600754-I).
c) Smoke density rating shall not be more than 60% (as per ASTMD-2843).

The circular trailing cables shall be either in accordance with IS 4289 Part-I (Elastomer insulated) or IS-4289 Part-II (PVC insulated). The flat type trailing cables if offered shall be in accordance with IEC-60227-6. All wiring / cabling between the equipments in the lift machine room and that between the machine room and equipments in the lift well and at the landings shall be wired in HDP conduits/ galvanized steel conduits to be supplied by the contractor. Alternatively armored cables may be used.

7.00.00 Earthing:

The elevator structures and all Electrical equipment, including metal conduits shall be effectively earthed with the earth conductors provided in the machine room as per IS: 3043.

Passenger/ Service Elevators

TEST /CHECK / ITEM	Material Test	DPI/MPI	Ultrasonic Test	Dimensions/Physical	Functional/ Operational Test/ Run Test	Performance Test	Other Tests	All routine tests as per applicable standard	Plain shade, thickness & adhesion	Assembly/fit up
Shaft/ Rack/Gears	Y	Y	Y	Y						
Plates	Y			Y						
Wire rope				Y			Y5			
Safety device								Y		
Geared Machine					Y					
VVVF Drive					Y		Y3	Y		
Power, Control & Trailing Cables								Y4		
Control Panel				Y					Y	
ARD System					Y			Y		
Electrical motor								Y		
Complete Elevator				Y	Y	Y1	Y2			Y

Y1 –TEST TO BE DONE AT SITE

Y2 - LOAD/OVERLOAD TEST TO BE DONE AT SITE AS APPLICABLE.

Y3 – Burn in test on electronic card

Y4 – Routine tests including FRLS tests as per Tech. Spec.

Y5- Test report as per relevant std.

NOTE: 1. This is an indicative list of tests/checks. The manufacturer is to furnish a detailed quality plan indicating the applicable practices and procedures followed along with relevant supporting documents during QAP finalization.

2. Makes of all bought out items shall be subject to NTPC approval

2.00.00 **ELEVATORS FOR ESP CONTROL ROOM**

2.01.00 **Technical Information**

i) Detailed description of equipments .....

ii) Write up on interlocks and safety devices provided .....

iii) Schedule of motors .....

iv) General arrangement of elevators .....

v) Electrical control scheme .....

vi) Foundation details and loading .....

2.02.00 **Design Data**

i) Manufacturer .....

ii) Capacity (kg) .....

iii) Speed (M/sec) .....

iv) Acceleration & deceleration (m/sec^2) .....

v) Method of control .....

vi) Mode of operation .....

vii) Car finish .....

viii) Location of machine room .....

ix) Levelling limits of car from landing floor (mm) .....

x) Elevator Car .....

a) Travel (mm) .....

b) Entrance size (mm x mm) .....

c) Platform length (mm) .....

d) Platform width (mm) .....

xi) Elevator Pit

a) Depth (mm) .....

b) Inside length (mm) .....

c) Inside width (mm) .....

d) Entrance height (mm) .....

e) Entrance width (mm) .....

xii) Hoist way

a) Height (M) .....

b) Inside length (mm) .....

c) Inside width (mm) .....

d) Entrance height (mm) .....

e) Entrance width (mm) .....

xiii) Machine room

a) Total clearance height (M) .....

b) Room height (M) .....

c) Height from top floor to underside of supporting member (M) .....

xiv) Total weight of elevator with elevator shaft structures (tonnes) .....

xv) Total weight of elevator structures (tonnes) .....

xvi) Electric Brake .....

a) Manufacturer .....

b) Type .....

c) Operating coil (AC or DC) .....

d) Size .....

e) Brake drum diameter

(mm) .....

f) Brake drum face width (mm) .....

g) Brake drum & liner material .....

xvii) Traction Sheave

a) Diameter (mm) .....

b) Material .....

xviii) Ropes

a) Diameter (mm) .....

b) Wire material .....

c) Construction .....

d) Core material .....

e) Guaranteed minimum breaking strength of rope (kg/cm^2) .....

xix) Emergency battery and charger ratings .....

3.00.00 ELEVATORS FOR RAPER PANEL ROOMS ON ESP ROOF (IF APPLICABLE)

3.01.00 Technical Information

i) Detailed description of equipments .....

ii) Write up on interlocks and safety devices provided .....

iii) Schedule of motors .....

iv) General arrangement of elevators .....

v) Electrical control scheme .....

vi) Foundation details and loading .....

3.02.00 Design Data

Annexure –6 to Amendment No. 1 to SECTION-VI

i) Manufacturer .....

ii) Capacity (kg) .....

iii) Speed (M/sec) .....

iv) Acceleration & deceleration (m/sec_2) .....

v) Method of control .....

vi) Mode of operation .....

vii) Car finish .....

viii) Location of machine room .....

ix) Levelling limits of car from landing floor (mm) .....

x) Elevator Car .....

a) Travel (mm) .....

b) Entrance size (mm x mm) .....

c) Platform length (mm) .....

d) Platform width (mm) .....

xi) Elevator Pit

a) Depth (mm) .....

b) Inside length (mm) .....

c) Inside width (mm) .....

d) Entrance height (mm) .....

e) Entrance width (mm) .....

xii) Hoist way

a) Height (M) .....

b) Inside length (mm) .....

c) Inside width (mm) .....

d) Entrance height (mm) .....

e) Entrance width (mm) .....

xiii) Machine room

a) Total clearance height (M) .....

b) Room height (M) .....

c) Height from top floor to underside of supporting member (M) .....

xiv) Total weight of elevator with elevator shaft structures (tonnes) .....

xv) Total weight of elevator structures (tonnes) .....

xvi) Electric Brake .....

a) Manufacturer .....

b) Type .....

c) Operating coil (AC or DC) .....

d) Size .....

e) Brake drum diameter (mm) .....

f) Brake drum face width (mm) .....

g) Brake drum & liner material .....

xvii) Traction Sheave

a) Diameter (mm) .....

b) Material .....

xviii) Ropes

a) Diameter (mm) .....

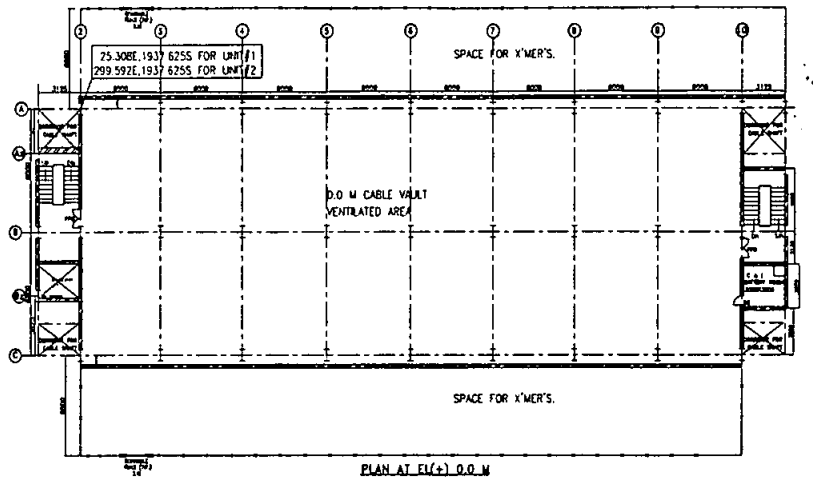
b) Wire material .....

c) Construction .....

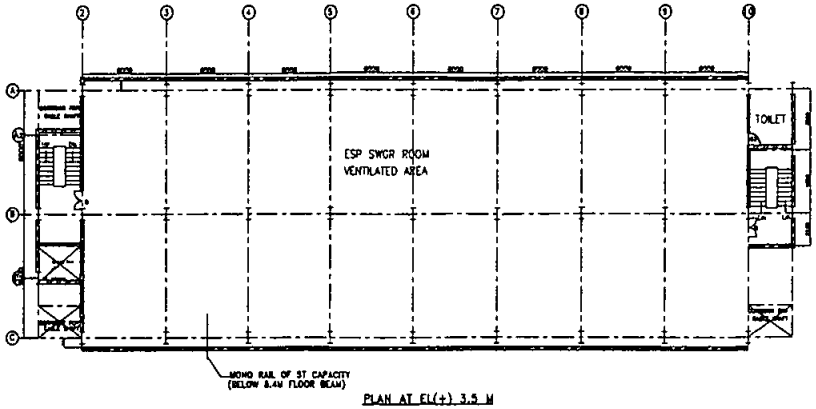
d) Core material .....

e) Guaranteed minimum breaking strength of rope (kg/cm^2) .....

xix) Emergency battery and charger ratings .....



PLAN AT EL(+) 0.0 M



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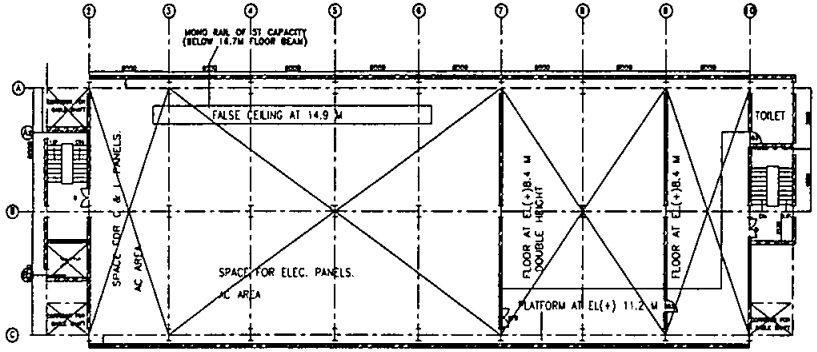
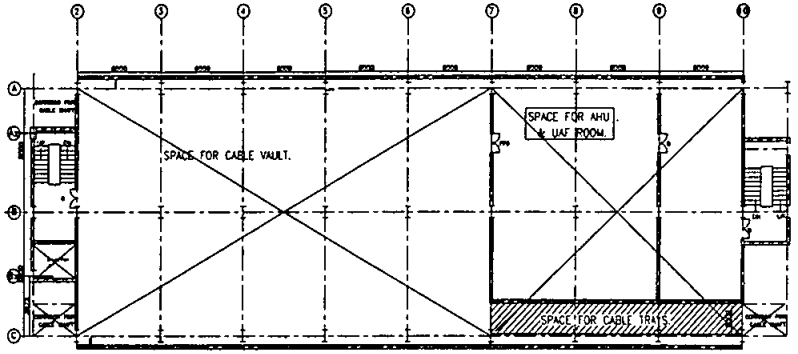
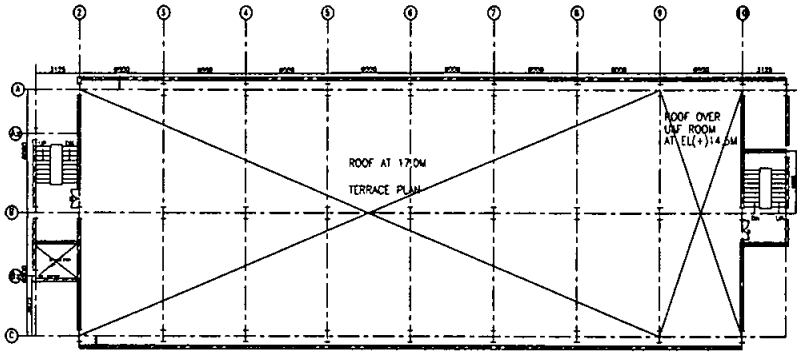


PLAN AT EL(+) 11.5 M



PLAN AT EL(+) 8.4 M



PLAN AT EL(+) 16.7 M

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METER UNLESS NOTED OTHERWISE.
2. ALL LEVELS MENTIONED ARE FINISHED FLOOR LEVELS
3. LOAD ON FLOOR SHALL BE 1TON/SQM FOR SWGR PANEL AND 0.5 TON/SQM FOR CABLE TRAY.
4. AC DUCT LAYOUT FOR CONTROL ROOM SHALL BE FINALIZED DURING DETAILED ENGG.
5. VENTILATION DUCTS ROUTING FOR SWITCHGEAR AREA & CABLE VAULT AREA SHALL BE FINALIZED DURING DETAILED ENGG.
6. ALL CLEAR HEIGHT ARE BETWEEN TOP OF FINISHED FLOOR AND BOTTOM OF BEAM.
7. 2 NOS ODU SHALL BE PLACED ABOVE THE AHU ROOM.

NTPC Ltd.
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: LARA SUPER THERMAL POWER PROJECT STAGE-I (2X800 MW)

TITLE: ESP CONTROL ROOM BUILDING (UNIT 1&2)

SIZE: A0 | SCALE: | DRG NO. 9548-000-POE-F-0122-SK1 | REV. 0

DRAWING NO. 4-89-616-00515

PROJECT : NTPC - LARA (2 X 800 MW)

ESP CONTROL ROOM ELEVATOR DETAILS (PRELIMINARY)

ELEVATOR DETAILS :-

Passenger Lift Capacity : 588 Kgs (for 8 persons)
Rated Speed : 1 m/s
Lift Pit - 1.9m Wide x 1.9m Deep
Lift Well - 1.6m Depth
Roof of machine room - 4.0m High
Machine room - 3.1m x 4.1m

NORTH

ALL DIMENSIONS ARE IN MILLIMETRES

NOTE:

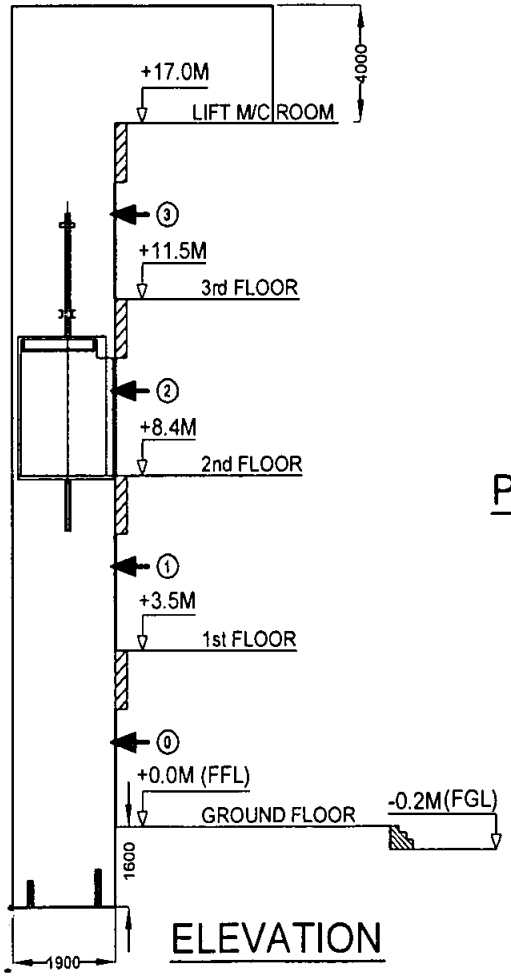
1. Maximum loading on Lift Pit wall - 10000 Kgs.
2. EL (±)0.0m refers to RL _____m MSL, which is finished ground floor level of main power house building.
3. All the furnished details are tentative only, will be confirmed after elevator vendor finalisation.

The lift shall be designed in line with the recommendations contained in the latest editions of Standards IS:14665:200(All parts)

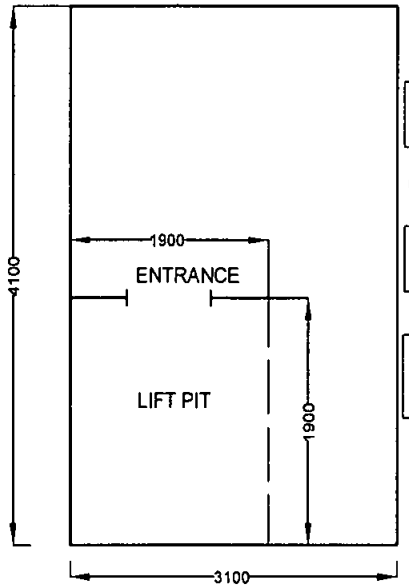
Quantity: 1 no for cust no:R819 and 1 no for Cust No:R820. Totally 2nos

The lift shall be offered as per the technical specification TEP:ELEVATOR: NTPC-LARA-Rev00 Dated 18-10-2014

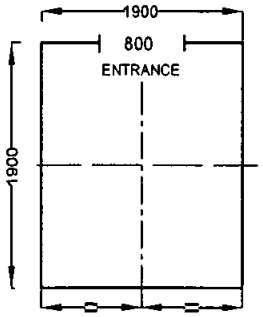
Scope of work includes Lift design,engineering,Manufacture,Inspection testing,delivery,erection,site testing,commissioning and maintenance & services during Guarantee period



ELEVATION



PLAN OF MACHINE ROOM



C.L of Car

PLAN OF LIFT PIT

CUSTOMER NOS: R819 & R820

NATIONAL THERMAL POWER CORPORATION LTD.

LARA SUPER THERMAL POWER PROJECT
STAGE-I (2X800 MW) UNITS 1 & 2
ELECTROSTATIC PRECIPITATOR PACKAGE

BHARAT HEAVY ELECTRICALS LIMITED, UNIT: BOILER AUXILIARIES PLANT, RANIPET-632 406.

DEPT CODE		NAME	SIGN	DATE
862	DESN	A.VERMA		25.11.14
	CHD	M.K.NAHAR		25.11.14
	APPD	C.GANESH		25.11.14

TITLE: PASSENGER ELEVATOR FOR ESP CONTROL ROOM (PRELIMINARY DATA)

SCALE : N.T.S

DRAWING NO. 4-89-616-00515

REV 00

Size A4