NTPC Ltd.

(A Government of India Enterprise)

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

TECHNICAL SPECIFICATION
FOR
ELEVATORS

SPECIFICATION NO.: PE-TS-508-502-A001

BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P
INDIA

INDEX

SECTION – A: SPECIFIC TECHNICAL REQUIREMENT

1.0 Brief Description and Use of Equipment/System

Elevator(s) shall be provided for access to various operating floors / platforms for LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW) to facilitate movement of goods and operation & maintenance (O&M) personnel.

2.0 Scope of Equipment Supply and Services

2.0.1 Brief Scope:

Design, Engineering, Manufacture, Inspection & Testing at manufacturer's works or at their sub-vendor's works, Painting, duly packed for transportation to site, delivery to site, storage and handling at site, Erection & Commissioning, carrying out trial run and Acceptance / functional tests at site & final painting and handling over of Passenger Elevators

2.0.2 Codes & Standards: IS: 14665 (Latest edition, all 5 parts).

2.0.3 Technical Data sheet of Elevator:

Sl. No.	Building	No. of Elevators	Capacity (Kg)	No. of Landings	Total Travel	Type of Service
1	TG Building - Unit #1	1	884	4 (including Ground)	28.0 m	Conventional (Passenger Elevator)
2	TG Building - Unit #2	1	884	5 (including Ground)	28.0 m	Conventional (Passenger Elevator)
3	ESP Control Room Building	2	680	3 (including Ground)	9.0 m	Conventional (Passenger Elevator)

Further, Bidder's scope for the Elevators shall include the following:

SN.	Description	Requirement (to be complied by bidder)
1	Hoist way size	As per IS: 14665 (Latest edition, all 5 parts).
2	Car size	
3	Car opening	
4	Rated Speed	1 m/s
5	Car entrance	One (1) on each floor
6	Method of Control	AC VVVF Control with automatic level adjustment.

7	Elevator Pit	Size: As per IS: 14665 (Latest edition all 5 parts).
8		Bare pit (i.e. without any RCC block / pedestal for buffer for CAR & CWT). Accordingly, MS structure & buffer required for elevator resting shall be provided by bidders.
9	Motor speed control	Microprocessor based Control with automatic level adjustment.
10	Logic control	Selective Collective Controller with variable voltage variable frequency drive and Microprocessor based software-controlled logic system. The control system shall be of field proven design and having satisfactory track record.
11	Machine room and elevator shaft.	Bidder to provide split Air Conditioner as per machine room area (not less than 2T Capacity).
12	Position of Machine Room	Directly above the elevator shaft.
13	Method of operation of car and landing doors.	Power operated with automatic horizontal sliding center opening & closing car and landing doors.
14	Car enclosure, car door & landing door	SS 304, min 1.5 mm thick, hairline finish sheet.
15	Door construction	Hollow metal construction from min 16-gauge thick steel sheet with spray painted.
16	Car Flooring	Vitrified ceramic tiles of mat finish.
	Car roof	Car roof shall be covered with sheet metal and shall be provided with LED light fitting & a three pin plug 5/15A, socket with switch on top of lift car.
17	Car & landing door	Protected by central opening horizontal sliding stainless steel door (Horizontal bi-parting door). The door of car and landing shall be interlocked in such a way opening & closing of two doors shall be simultaneous and the doors will open when the lift is in lading zone.
18	Controller and type	Selective Collective Controller with variable voltage variable frequency drive and Microprocessor based software-controlled logic system
19	Operation of elevator	Automatic simplex collective with and without attendant with provision for locking control in “auto” or “Attendant” position. Key type lock switch shall be provided. Push button shall be fixed in the car for holding the doors open for any length of the time required.
20	Signal / Indicators	Car position indicator in car, hall position indicator at all floors, Up and down travel direction position indicator telltale lights at all floors, overload warning indicator, battery operated alarm bell and emergency light and fan and hands-free speaker telephone set with suitable battery, charger and controls. Remote alarm shall be provided.

	(a) Type of construction	As per manufacturer's standard
	(b)Type of display	7 segment LED display.
21	Fan, Lighting at Machine room, Shaft & pit.	One cabin fan, two LED light fittings on car roof. Lux level: 100 min. LED lighting with a 5A, 3 pin socket & switches or as required by bidder during erection / maintenance purpose shall be provided at every 3 meters' interval in lift well/ hoist way. Light and fan in the Car enclosure shall be separate switch control.
21	Trailing cables	FRLS type.
22	Power supply: a) Power b) Lighting & fan	Two nos. 415 Volts, (+/- 10% variation), 3 Phase, 50 Hz (+3% to -5% variation), combined voltage variation 10%, 3 wire system supply at machine room will be provided by customer/ BHEL in the machine room. Other supply as required like control supply 110 V AC etc. need to be suitably derived by supplier. Power supply for motors Air conditioner, switch sockets, illumination of shaft etc. to be derived and distributed by elevator supplier with MCCB/ MCB & Cables.
23	EPABX requirements	Internal telephone wiring and telephone hand set to be provided. The external connection shall be provided by Customer. Also, automatic rescue device shall be provided.
24	Elevator Features	
a)	Isolating cushion b/w car and car frame	Type of cushion shall be rubber pad or spring, as per manufacturer's standard.
b)	Three pin plugs with socket on car top	5/15A, 3 pin plug sockets with switch on top of lift car and inside shaft to take care maintenance requirement.
c)	Car frame	Material: Mild Steel Type of construction: Bolted
d)	Fire rating of Landing Door	Fire rated for min. 2 hours. (as per IS:14665)
f)	Door hanger tracks	Yes, complete with accessories shall be provided.
g)	Safety shoes	Yes, complete with accessories shall be provided.
h)	Safety device for door operation	Full length Infrared light curtain along with pressure limiter as an extra mechanical safety to be provided.
i)	Handrails on three sides of car	Mirror finish stainless steel at suitable height.
j)	False ceiling	SS 304. (Thickness as per supplier's standard).
k)	Emergency stop switch	To be provided
l)	Braille switch	To be provided
m)	Floor announcement	To be provided

	cum music system	
25	Control & Operation	
	(a)Type of control	Simplex / Duplex
	(b)Type of drive	Variable Voltage Variable Frequency Drive
25	Car operating panel	To be provided
	(a) Type of construction	Partial Height Car Operating Panel (COP), removable type from Car with SS face plate.
	(b) Push Buttons	Luminous type (IP 54).
27	Car position indicator	To be provided (both visual and audio) combined with direction arrows, overload warning indicator, battery operated alarm bell and emergency light and fan and handsfree speaker telephone set with suitable battery, charger and controls.
	(a) Type of construction	As per manufacturer's standard
	(b) Type of display	Seven (7) segment LED display.
28	Push button station and call registered tell-tale lights	Provided in each landing
	(a) Type of construction	Box type with SS face plate
	(b)Push Buttons	Luminous push buttons with IP 54
29	Apron / Fascia Plate	Yes (To be provided by supplier) as per IS 14665
30	Emergency Light	Required.
31	Terminal buffers, type and number	Spring buffers for car and counterweight shall be provided as per IS 14665.
32	Load plate	As per manufacturer's standard
33	Counter weight	Frame: Fabricated Steel Construction Fillers: Cast Iron
34	Guide rails	Guide rails complete with supporting brackets for the car and counter weights.
35	Limit Switches	To be provided, as per requirement
	a) Location	Bottom & top terminal
	b) Type	Electro-mechanical
	c) Operation	Cam Operated
36	Reverse phase relay and other protective devices	To be provided
37	Emergency safety devices	The lift shall be provided with safety device attached to the lift car frame and sustaining the lift car up at governor tripping speed with full rated load in car.
38	Car Safety & Governor	
	a) Stopping distance	As per IS:14665
	b) Type and mode of operation of Over	Centrifugal action

	speed Governor device	
	c) Tripping speed and design code	Conforming to IS: 14665 (Latest addition)
	d) Location	At machine room.
	e) Brakes	DCEM brakes.
39	Motor details	
	(a) Type	3 phase AC squirrel Cage Induction motor
	(b) Type of Duty	Lift Duty
	(c) Duty	S4 / S5
	(d) Duty Cycle	40%
	(e) Applicable standard	IS: 325
	f) No. of Starts per Hour	Elevator Motor shall be suitable for minimum of 150 Starts per hour.
	g) Direction of rotation	Both Clockwise & Anti-clockwise
	h) Class of Insulation	F, temp rise limited to class B. Motor shall be provided with thermal class 130 (B) or better insulation.
	i)Method of Starting	AC Variable Voltage Variable Frequency Drive
40	Door Motor	
	a) Equipment driven by Motor	Door
	b) Direction of rotation	Both Clockwise & Anticlockwise
	c) Type of enclosures	IP 54
41	Metallic Wire Mesh between Car & Counter Weight	To be provided
42	Fire Man Switch	To be provided
43	Sound Reducing Material	Isolation Rubber / other arrangement in the Machine shall be provided
44	Automatic Rescue Device (Battery Drive)	Automatic Rescue Device (ARD) with battery drive - Modern advanced electronic drive system of rescuing passenger trapped in an elevator shall be provided.
45	Ropes for hoisting	To be provided. Factor of safety for rope shall be 12 (min) or as per IS: 14665, whichever is higher.
46	Design seismic coefficient	According to IS: 1893 (an additional information for elevator building only)
47	Fire extinguisher	½ Kg CO_2/ other suitable Fire extinguisher along with fixing arrangement to be provided.
48	Ladder in pits	To be provided
49	Fixing/ Fasteners/ Embedment	All fixing materials require fixing rails, brackets, equipment including nuts and bolts. All steel embedment for fixing landing doors / indicators

		etc. to the elevator well shaft and fascia plate shall be supplied by the bidder.
50	Statutory requirement	All prevailing requirement(s) of statutory and regulatory body shall be included by bidder in their scope. Bidder shall be responsible for obtaining all necessary approval from statutory and regulatory body and lift inspector. However, Purchaser will furnish required information, as and when required.

2.0.4 Commissioning and Start-up Spares:

Bidder to include in the main supply**.**

2.0.5 Exclusion

1) Complete civil works for hoist way, machine room, pit complete with the side enclosure (Brick / RCC), interconnecting platform (if any) and monorail beam.

   Minor civil work including grouting for foundation bolts and supporting structure/ beams at RCC pedestals in the machine room, as required shall be taken care of by bidder during installation of elevator.

2) Trap door along with fixing arrangement and Electric hoist with travelling trolley of 3T capacity to facilitate handling of equipment in the machine room.

3) Power supply cable (AC 415 V, 3 Ph, 50 Hz) up to machine room level. Further cabling (all cables including power, control and instrumentation as per tender specification) shall be provided by the bidder.

4) Supply & fixing of Shaft reduction channel, if any.

2.0.6 Terminal Points & Other Requirements:

1) BHEL / Customer will provide the elevator shaft complete with foundation and brick walls around the elevator shaft together with overhead machine room. The machine room will be provided with RCC floor slab with necessary pockets for anchor bolts and slots.

2) Dummy landing/s, as required in case travel between two consecutive landings is more than 10 m, shall be considered by bidder in their offer.

2.0.7 List of Tools & tackles for Elevator (Bidder to include in Main Supply)

Sl. No.	Description	Qty.	Remarks
1	Spanner of all sizes required for maintenance	1 Set	
2	Adjustable Spanner	1 No.	
3	Allen Key set all sizes required for maintenance	1 Set	
4	Screw driver set	1 No.	
5	Cutting plier	1 No.	
6	Grease gun	1 No.	
7	Nose plier	1 No.	
8	Grip plier	1 No.	
9	Hook spanner	1 No.	
10	Box spanner	1 No.	
11	Oil can	1 No.	
12	Measurement Taps	1 No.	
13	Paint brush 1/4,1/2,3/4 inch	1 No. of each	
14	Line tester	1 No.	
15	Multimeter	1 No.	
16	Soldering iron	1 No.	
17	Torch Light	1 No.	
18	Knife cutter	1 No.	
19	Steel rule	1 No.	
20	Wire Striper	1 No.	
21	Tube Spanner Combination	1 No.	
22	Hammer 1/2 Kg	1 No.	
23	Dial wrench	1 No.	

2.0.8 List of Mandatory Spares for Elevator (Refer Price Schedule)

One (1) Set common for both elevators of TG Building and One set common for both elevator of ESP Control Room building of Mandatory Spares (listed below).
Total two (02) Sets to be supplied by bidder.

For TG Building Elevator			
Sl. No.	**Description**	**UoM**	**Qty.**
1	Over current relay of each type	Nos.	2
2	Auxiliary relays of each type	Nos.	3
3	Friction block	Nos.	2
4	Guide roller of each type	20% of total population or 3 Nos. of each type whichever is high	
5	Contactors of each type	Nos.	2

6	Control transformer of each type	No.	1
7	Time device of each type	Nos.	2
8	Rectifiers of each type	Nos.	2
9	Resistor of each type	Nos.	3
10	Fuses of each rating	20% of the total population	
11	Limit switches of each type	Nos.	3
12	Push button of each type	Nos.	3
13	Contact device (if applicable) of each type	Nos.	3
14	Brake motor of each type	Nos.	2
15	Transmitters of each type	Nos.	2
16	Switches of each type	Nos.	3
17	Receiver of each type	Nos.	2
18	Bearings of each type & size	Nos.	2
19	Roller of each type	Nos.	3
20	Worm gear spares		
20.1	'O' rings	Sets	3
20.2	Sealing ring of each type	Sets	3
21	Spares for brake		
21.1	a) Fan of each type	Nos.	2
21.2	b) Magnetic coil of each type	Nos.	3
21.3	c) Brake disc	Sets	2
21.4	d) Brake pad	Sets	2
22	Bushing (for door front)	Sets	2
23	Pinion of each type	Nos.	2
24	Lift Main drive motor of each type & rating	No.	1
25	Door opening motor of each type & rating	No.	1
26	Landing door complete	No.	1
27	Car door complete	No.	1
28	VFD drive of each type & rating	No.	1

* One set means one complete replacement for one equipment.

For ESP Control Room building			
Sl. No.	**Description**	**UoM**	**Qty.**
1	Friction block	nos.	2
2	Guide roller of each type	20 of total population or 3 nos. whichever is higher	3
3	Contactors of each type	nos.	2
4	Bushing (for door front)	Sets*	2
5	Pinion	nos.	2
6	Worm gear spares		
a	'0' rings	Sets*	4

b	Sealing ring of each type	Sets*	4
7	Time device/ Timer card	nos.	2
8	Rectifiers of each type & ratings	Nos.	2
9	Resistor (If applicable) of each type & rating	nos.	3
10	Fuses, MCB / Switches of each rating	nos.	2
11	Limit switches of each type	nos.	3
12	Push button -Complete replacement of one elevator	no. (for one elevator)	1
13	Contact device (if applicable) of each type & ratings	nos.	3
14	Brake motor / Magnet (as applicable) of each type / rating	nos.	1
15	Bearings of each type & ratings	nos.	1
16	Magnetic coil	nos.	3
17	Floor indicator display units of each type	nos.	1
18	Lift Main drive motor of each type & ratings	Nos.	3
19	Door opening motor of each type & rating	nos.	1
20	Landing door complete	Set9	1
21	Car door complete	Set*	1
22	VFD drive of each type & rating	nos.	1

* One set means one complete replacement for one equipment.

3.0 Painting / Details of Special Treatment of Elevator:

All the elevator components shall be given special corrosion resistant treatment. Painting of all equipment's / items within the battery limit.

SN.	Components description	Specified requirements
1	Machine	Anti- corrosive epoxy paint
2	Car & counter weight	Anti- corrosive epoxy paint
3	Car & counterweight buffers	Anti- corrosive epoxy paint
4	Fish plates	Anti- corrosive epoxy paint
5	Buffer pedestals (structural)	Anti- corrosive epoxy paint
6	Brackets & rail fasteners	Anti- corrosive epoxy paint
7	Brake adjusting screw & coupling fasteners	Zinc passivated
8	Brackets	Anti-corrosive epoxy paint.
9	Controller cabinet	Anti- corrosive epoxy paint as per industry standard
10	Hall buttons	Dust proof with SS hardware.
11	Car operating panels (COP)	Dust proof contact & button with aluminum face plate and SS hardware. Main face plate S.S.
12	Governor	Cover & casting epoxy painted. Other component zinc plated.
13	Governor tension frame	Hot dipped galvanized and anti-corrosive epoxy paint with MS shaft for sheave.
14	Car frame, level brace rods and counter weight frame	Anti- corrosive epoxy paint
15	Safety equipment (Linkage)	Zinc plated

16	Safety switch & car gate switch	IP:65, Dust proof heavy zinc plated.
17	Guide shoe	Zinc plated
18	Filler weights	Anti- corrosive epoxy paint
19	Rope fasteners	Zinc passivated and chromate dipped.
20	Hoist/ Governor rope	Greased, Self-lubricating
21	Hall position and car position indicator.	Dust proof with stainless steel enclosure and face plate.

4.0 Degree of Protection (DOP) of various equipment:

Sl. No.	Equipment	Degree of Protection
1	AC Motor	IP 54
2	Control Panel	IP 65
4	Hall Button Fixture	IP 54
5	Position Indicator	IP 54
6	Car Operating Panel (COP)	IP 54
7	Car Position Indicator	IP 54
8	Landing Operating Panel (LOP)	IP 54
9	Safety Operating Switch (Car)	IP 65
10	Brakes	IP 54

5.0 Input Drawings by BHEL (Annexure-B):

Sl. No.	Drawing/ Document Title	Drawing No.
1.	Engg. Input Drawing for 884 KG Capacity Elevator for TG Building- Unit #1	PE-DG-508-502-A001
2.	Engg. Input Drawing for 884 KG Capacity Elevator for TG Building - Unit #2	PE-DG-508-502-A002
3.	Engg. Input Drawing for 680 KG Capacity Elevator for ESP Control Room	PE-DG-508-502-A003

6.0 Master Drawing List (MDL) and Submission Schedule:

Preparation of all necessary drawings / data sheets / documents / calculations as required for obtaining necessary local administration permits / approval from statutory authority and make arrangement for inspection and tests required thereby for necessary approval on behalf of the customer. Fees (as required) for obtaining approval from statutory bodies shall also be included in the scope of work of the bidder.

All drawings shall be prepared as per BHEL's title block and bear BHEL's drawing No. and customer / consultant's drawing no; which will be forwarded to the successful bidder during detail engineering stage. Bidder to submit revised drawings complete in all respects incorporating all comments. Any incomplete drawing

submitted shall be treated as non-submission with delays attributable to bidder's account.

Sl. No.	BHEL DOC No.	TITLE	No. of days
1	PE-V0-508-502-A001	TECHNICAL DATA SHEET FOR TG BUILDING ELEVATOR- Unit #1&2	14
2	PE-V0-508-502-A005	O&M MANUAL FOR ELEVATOR (COMMON FOR TG BUILDING, AND ESP CONTROL ROOM BUILDING)	70
3	PE-V0-508-502-A006	WIRING DIAGRAM & POWER DISTRIBUTION SCHEMATIC (FOR EACH ELEVATOR)	21
4	PE-V0-508-502-A007	GA, M/C ROOM LAYOUT, SCOPE & BOM AND DIMENSIONAL DETAILS OF TG BUILDING ELEVATOR- Unit #1&2	14
5	PE-V0-508-502-A008	TECHNICAL DATA SHEET FOR ESP BUILDING ELEVATOR	14
6	PE-V0-508-502-A009	GA, M/C ROOM LAYOUT, SCOPE & BOM AND DIMENSIONAL DETAILS OF ESP BUILDING ELEVATOR	14
7	PE-V0-508-502-A013	QUALITY PLAN (COMMON FOR ALL ELEVATORS)	2

*Except Sl No. 2 & 3, other drawings will be in Approval category and considered in delay analysis.
** Schedule of Submission in No. of weeks from date of LOA/PO.

After final acceptance of individual equipment/ system by the BHEL/ Customer, the bidder will update all original drawings and documents for the equipment/ system to "as built" conditions and submit to BHEL/ Customer.
Refer GCC for modalities of Engineering Documents Submission.
Every repeat submission by Supplier: Within ten (10) days.
Response time by BHEL: Within three (3) weeks after receiving of drawing.
Delay beyond the stipulated duration shall be considered in delay analysis.

The number of copies/prints/CD-ROMs/manuals to be furnished for various types of document is given in the table below:

Sl. No.	Description of Drgs. / Docs.	No. of Prints	No. of Portable Hard Disk
1	**Drawings/ Documents**		
1.1	First submission and submission with major changes	4	-
1.2	Final (Directly to site)	6	2
1.3	"As Built" (Directly to site)	6	2
2	Operation & Maintenance manual i) First Submission	1 set	

	ii) Final Submission (Directly to site)	4 sets	2

7.0 Electrical Specification:

i) Electrical scope between BHEL and Bidder is enclosed as Annexure-1.

ii) Electric Motor

The driving motors shall be squirrel cage induction type conforming to IS: 325 and suitable for variable voltage variable frequency (VVVF) operation at 415 V (+/- 10% variation), 3 Phase, 3 wire, 50 Hz (+3% to -5% variation) supply. For the purpose of design of equipment/systems, an ambient temperature of 50 °C and relative humidity of 95% (at 40 deg C) shall be considered. The equipment shall operate in a highly polluted environment. Motors shall be provided with class F insulation & temp rise limited to class 130 (B). Protection class for motor shall be IP 54.

iii) Controls

The control shall be variable voltage and variable frequency type and shall provide smooth and constant acceleration and retardation under all conditions of operation. Suitable control panels shall be provided in the machine room. The lift will be automatically stopped by upper and lower terminal switches. The elevators will have an emergency stop switch, limit switches and other safety devices according to statutory rule.

iv) Cables and Wirings

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. The voltage grade shall be 1100V. 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.

(i) Oxygen index of min. 29 (as per IS:10810 Part-58)
(ii) Acid gas emission of max. 20% (as per IEC-754-I)
(iii) Smoke density rating shall not be more than 60% (as per ASTM D 2843)

All wiring / cabling between the equipments in the lift machine room and that between the machine room and equipment in the lift well and at the landing shall be wired in HDP conduits / galvanised steel conduits to be supplied by the bidder. Alternatively, armoured cables may be used.

v) Earthing

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

8.0 Functional Guarantees / Tests:

Trial operation, commissioning, performance/ demonstration guarantee tests shall be carried out at site as follows:

A. Rated capacity of the Elevator.
B. Travel and hoist Speed of the Elevator.
C. Accurate positioning of the Elevator.
D. Over Load test of the Elevator as per IS:14665 (Latest edition)

9.0 Quality and Inspection:

Quality Plan has been provided in this specification for reference. Bidder shall submit the Quality Plan for BHEL/ Customer approval after award of the contract during detailed engineering stage without any commercial & delivery implication to BHEL.

10.0 Packing, Transportation and Site Handling:

The complete material shall be supplied in suitable lockable sealed container. All elevator material will be packed in wooden box except guide rail and the wooden box will be placed in the container for dispatch. Site handling is in bidder's scope and preservation of elevator components shall be taken care by bidder suitably.

10.0 List of makes of components of Elevators:

SN.	Item	Name of Supplier	Place	Remarks
1.	WIRE ROPES	USHA MARTIN	RANCHI	
		BHARAT WIRE ROPE	MUMBAI.	
2.	TRAILING CABLE	GEBAUR & GRILLER- AUSTRIA		
		DAETWYLER (THELMA) CABLES	SWITZERLAND	
		LAPP	GERMANY	
		UNIVERSAL	-	
		INCABSTEP	-	
3.	BUFFER SPRINGS	INDUSTRIAL STEEL SPRING	-	
		ALL INDIA STEEL SPRING MANUFACTURING COMPANY	-	
		KOLKATA SHAW COMPANY	KOLKATA	
		SUPER INDIA SPRINGS	KOLKATA	
		MESCO SPRING.	MUMBAI.	
4.	GEAR	PREMIMUM ENERGY	PUNE	

SN.	Item	Name of Supplier	Place	Remarks
	INTERNALS	TRANSMISSION LTD		
		SICOR S.P.A.	ITALY	
		OEM		
5.	DRIVER MOTOR	SIEMENS	MUMBAI	
		ABB	FARIDABAD	
		BHARAT BIJILI	-	
		CGL	-	
		KIRLOSKER ELECTRIC CO LTD	-	
		OEM	-	
		NGEF		
		MARATHON		
		GE POWER		
		RAJINDRA ELECT INDUSTRIES		
		LAXMI HYDRAULICS PVT. LTD.		
6.	STAINLESS STEEL	SAIL	-	
		MINOX METAL	-	
		JINDAL	-	
7.	CR SHEET	ARCELOR MITTAL/ NIPPON STEEL	-	
		TATA STEEL BSL LIMITED	-	
8.	CABLES	DELTON	-	
		NICCO	-	
		UNIVERASL	-	
		FINOLEX	-	
		CCI	-	
		MACROTHREM	-	
		VARSHA CABLES	-	
		KEI.	-	
		PARAMOUNT	-	
		POLYCAB	-	
9.	RELAYS	SIEMENS	-	
		SCHNEIDER TELEMECHANIQUE	-	
		SALZER	-	
		SCHNIDER ELECTRIC	-	
10.	CONTACTORS	SIEMENS	-	
		L&T	-	
		GE	-	
		SCHNEIDER TELEMECHANIQUE	-	
11.	TRANSFORMERS	SHARP ELECTRONICS	-	
		MELCON CONTROLS	CHENNAI	
		LOGITECH	-	
		GUNHAWA ELECTRIC CO LTD.	-	
12.	INVERTOR (V3F)	YASKAWA	GERMANY	
		TOSHIBA	JAPAN.	
13.	T GUIDES	SAVERA	CHINA	

SN.	Item	Name of Supplier	Place	Remarks
		D.D HITECH	-	
14.	CAR DOOR OPERATOR	WITTUR GMBH	AUSTRIA	
		FERMATOR	-	
		OEM	-	
15.	INFRARED DOOR CURTAIN	MEMCO	UK	
		WECO	-	
		TLJONES	-	
16.	BATTERY (LEAD ACID)	EXIDE		
		HBL POWER SYSTEM	HYDERABAD	
		AMAR RAJA	TIRUPATI	
		AMCO SAFT INDIA LTD	BANGALORE.	

Note:

1. The sub-vendor list above is indicative and is subject to BHEL/ Customer approval during detailed engineering stage without any commercial & delivery implication to BHEL.

   Bidder to propose sub vendor within 4 weeks of placement of LOA. Thereafter, no request for additional sub-vendor shall be entertained.

2. In case of assembled imported elevator, makes of BOIs shall be subject to BHEL/ Customer approval during detail engineering stage without any commercial implication at contract stage.

3. Dealers are not acceptable for any item of the package. Bidder shall procure all items including plates, structural etc. from approved sub vendor only.

QUALITY ASSURANCE PLAN

बी एच ई एल BHEL		MANUFACTURING QUALITY PLAN M/S (_____)	PROJECT: LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW) PACKAGE: ITEM: ELEVATOR BHEL REF. NO.:					Q.P/FQP. NO & REV: DATE: PAGE: 1 of 4 JOB NO:				
1	2	3	4	5	6	7	8	9	10			11
Sr. No.	COMPONENT& OPERATION	CHARATERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMATE OF RECORD		AGENCY		REMARKS
									D	VE	M	B	
A. Boughtout Items :													
1	Raw materials, Round Hexagon & Structurals. Type : EN-8/EN-8D to EN-9,B and En-24	A: Chemical Composition	Major	Analysis	Sample	IS/BS : 970	IS/BS : 970	O.S.L/ T.C		V	V	V	
		B: Mechanical Properties	Major	Hardness	Sample	IS/BS : 970	IS/BS : 970	QA REG.		V	V	V	
		C: Dimensional Checks	Major	Measurement	100%	DRG.	DRG.	D.I.R/Q.C.R		V	w	V	
2	Raw material Rounds, En-8, EN-9, EN-24	Crack Detection	Major	Ultrasonic testing	100%	ASTM-388	ASTM -388	QA/FMT/03		V	W	V	
3	Casting : a. C.I. Graded Castings	A: Chemical Composition	Major	Analysis	Sample	IS-vendor DRG	AS PER DRG.	S.T.C	√	V	V	V	
		B: Mechanical Properties	Major	Hardness on traction sheave	Sample	vendor-DRG IS : 210	vendor-DRG IS : 210	S.T.C	√	V	V	V	
		C: Dimensional Checks	Major	Measurement	Sample	vendor-DRG	vendor-DRG	QA/FMT/02		-	W	-	
		D: Blow Holes	Major	Visual	100%	—	-	QA/REG		-	W	-	
4	Suppliers Item :												
	a. Manufactured Items	Dimensional Check	Major	Measurement	100%	vendor/DRG.	vendor/DRG.	D.I.R		-	W	-	
	b. Moldings Rubber Items (ABSORBER)	A: Dimensional Checks	Major	Measurement	100%	vendor-DRG.	vendor/DRG.	QA/FMT/02		-	W	-	
		B: Hardness	Major	Compression Test	Sample	vendor-DRG.	vendor-DRG.	QA/FMT/02		-	W	-	
	c. Springs (Buffer)	A: Dimensional Check	Major	Measurement	100%	vendor-DRG.	vendor-DRG.	QA/FMT/02		-	W	-	
		B: Spring Constant compression.	Major	Compression	Sample	vendor-DRG.	vendor-DRG.	S.T.C	√	V	V	V	
	d. Guide Rail.	A.Chemical Test.	Major	Analysis	Sample	vendor- DRG	vendor -DRG	S. T.C	√	V	V	V	
		B. Dimension check.	Major	Measurement	Sample	vendor-DRG.	vendor-DRG.	QA/FMT/02		V	W	V	
	e. Wire rope	A: Dimensional Check	Major	Measurement of O.D/ Const.	Sample	IS/2365 &	IS/2365 &	QA/FMT/02		-	W	-	
		B: Mechanical Properties.	Major	Measurement	Correlate S.T.C	IS : 2266	IS : 2266	S.T.C	√	V	V	V	

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CONTRACTOR SIGN AND SEAL .

NAME & SIGN OF APPROVING AUTHORITY & SEAL

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									D	VE	M	B	
	f. Power & control (PVC)cable	a- FRLS ,	Major	Electrical	Sampling	IS - 694	IS - 694	S.T.C	√	V	V	V	
		b- Insulation resistance.	do	do	do	do	do	do	√	V	V	V	
5	Raw material for motor. (1) Enameled wire.	a) Dimension Check	Major	Measurement	Sample	vendor -STD	vendor -STD	D.I.R		V	W	V	
		b) High voltage test	Major	Elect.	One Sample each roll	IS:4800	IS:4800	D.I.R		V	W	V	
	(2) Copper base (Flat)	Chemical check	Major	Analysis	Sample	Cu=min 99.5%	Cu=min 99.5%	O.S.L / T.C		V	V	V	
6	Finished Manufactured Components	Plating thickness control	Major	Measurement	Sample	vendor-STD.	vendor-STD.	vendor-STD		V	W	V	
B. Inspection During mfg.													
1	Machine Shop :	A: Dimensional Check	Major	Measurement	100%	vendor-DRG.	vendor-DRG.	QA/FMT/01		-	W	-	
		B: Crack detection Motor bodies	Major	D.P. Test	100%	vendor-STD.	vendor-STD.	-		-	W	-	
		C: Surface check	Major	Visual	100%	vendor-STD.	vendor-STD.	-		-	W	-	
2	Fabrication Shop :	Dimensional Checks of critical items	Major	Measurement	100%	vendor-DRG.	vendor-DRG.	Q.C.R		-	W	-	
		Welding	minor	Visual	Sampling	do	do	.		.	W	.	Welding by approved welder
C. Assembly Inspection.		A- Back lash of gears& Maching	Major	Measurement	100%	vendor	vendor	QA/FMT/11		V	W	-	
1	Winding gear.	contact.				INSP NORMS	INSP NORMS						
		B- Vibration .	Major	Measurement	100%	vendor	vendor	do		V	W	-	
						INSP NORMS	INSP NORMS						
		C- Noise level.	Major	Measurement	100%	vendor	vendor	do		V	W	-	
						INSP NORMS	INSP NORMS						
		D- Visual .	Oil leckage	Visual	100%	vendor	vendor	do		V	W	-	
						INSP NORMS	INSP NORMS						

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									D	VE	M	B	
2	Motor Assembly :	A-Winding Insulation test.	Major	High Volt. Test	100%	I S :325-96 1.5 KV for 5 SEC	I S :325-96 1.5 KV for 5 SEC.	D.I.R QA/FMT/13		V	W	V	
		B-Insulation Resistance	Major	Measurement	100%	> 10 mega ohms	> 10 mega ohms	Test report		V	W	V	
		C-Motor testing for elect. Pmt.	Major	Elect.	100%	IS : 325	IS : 325	Test report		V	W	V	
		D-Vibration measurement & noise lev	Major	Measurement	100%	vendor - Norms	vendor -Norms	Test report		V	W	.	
3	Speed Governor Assembly :	Tripping speed Easy Run test	Major	Function Check	100%	I S : 9878 LCH -112	I S : 9878 LCH - 112	T.C IN Pant.		V	W	V	
4	Controller Assembly / VVVF Unit.	1. Visual Inspection	Major	Visual	100%	vendor Norms	vendor Norms	T.C		V	W	V	
		2. Electrical Checks (Routine Test).	do	Electrical	100%	do	do	do		V	W	V	
		3. Functional Checks	do	Function	100%	do	do	do		V	W	V	
		4. Pretreatment in seven tank for sheet & paint thickness.	Major	Measurement + Visual	Sampling	do	do	vendor - FMT.		V	W	V	

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									D	VE	M	B	
5	Mechanical assembly :	Cage assembly .	Major	Measurement	100%	Appd. L/o DRG. vendor-INSP. Norms	Appd. L/o DRG. vendor-INSP. Norms	QA/FMT/15		V	W	V	
6	Painting	Parts & Components	Major	Cross Hatch Test	Sampling	vendor-INSP. Norms	vendor-INSP. Norms	QA / REG.		V	W	V	
			Major	Powder Coating Thickness Test	Sampling	vendor-INSP. Norms	vendor-INSP. Norms	QA / REG.		V	W	V	
6	Electrical Assembly	1- Break assembly .	Minor	Function check	Sampling	vendor- NORMS	vendor - NORMS	TC		V	W	V	

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SPECIFIC TECHNICAL REQUIREMENTS: ELECTRICAL

1.0 EQUIPMENT & SERVICES TO BE PROVIDED BY BIDDER/ PURCHASER

1.1 Scope for supply, and erection & commissioning of various equipment forming part of electrical system for this package shall be as per Annexure-I "ELECTRICAL SCOPE BETWEEN BHEL AND VENDOR FOR ELEVATOR".

1.2 BHEL will provide two number 415 V AC (3 PHASE 4 WIRE) supply feeder only up to isolating switch for each elevator. Any other voltage level (AC/DC) required will be derived by the vendor. Motor starter shall be part of elevator control panel.

2.0 DOCUMENTS TO BE SUBMITTED ALONG WITH BID

2.1 Bidder shall confirm total compliance to the electrical specification without any deviation from the technical/ quality assurance requirements stipulated.

2.2 No technical submittal such as copies of data sheets, drawings, write-up, quality plans, type test certificates, technical literature, etc, is required during tender stage. Any such submission even if made, shall not be considered as part of offer.

3.0 LIST OF ENCLOSURES

3.1 Electrical scope between BHEL & vendor (Annexure-I).
3.2 Technical specification - Motors (Annexure-II)
3.3 Technical specification- Cables & Cabling material (Annexure-III)
3.4 Datasheets (Annexure-IV)
3.5 Quality Plan for motors (Annexure-V)
3.6 Load data format (Annexure-VI).
3.7 Indicative Sub-vendor list (Annexure-VII)

ANNEXURE-1

REV: 00 DATE: 03.06.2025

STANDARD ELECTRICAL SCOPE BETWEEN BHEL AND VENDOR (FOR EPC PROJECTS)

PACKAGE: ELEVATORS
SCOPE OF VENDOR: SUPPLY, ERECTION & COMMISSIONING OF VENDOR'S EQUIPMENT
PROJECT: 2X800 MW LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)

S. NO	DETAILS	SCOPE SUPPLY	SCOPE E&C	REMARKS
1	Isolating Switch	Vendor	Vendor	BHEL will provide two number 415 V (3ph, 4W) supply feeder only up to isolating switches for elevators. Any other voltage level (AC/DC) required will be derived by the vendor. Motor starter shall be part of elevator control panel.
2	Power cables, control cables, screened control cables and any special cables (if required) between equipment supplied by vendor.	Vendor	Vendor	Cable from supply feeder to isolating switch shall be in BHEL scope.
3	Cabling material (cable trays, accessories, cable tray supporting system, conduits etc).	Vendor	Vendor	Local cabling from nearby main route cable tray (BHEL scope) to equipment terminal (vendor's scope) shall be through 100/ 50 mm. cable trays/ conduits/ Galvanised steel cable troughs, as per approved layout drawing during contract stage.
4	Equipment Earthing	Vendor	Vendor	All equipment metallic enclosures / frames, metal structure etc. shall be grounded at two points each to the nearest grounding points / risers provided by BHEL.
5	Motors	Vendor	Vendor	Makes shall be subject to customer/ BHEL approval at contract stage.
6	Cable glands and lugs for equipment supplied by vendor	Vendor	Vendor	1. Double compression Ni-Cr plated brass cable glands 2. Solder less crimping type heavy duty tinned copper lugs for power & control cables.
7	a) Input cable schedules (C & I) b) Cable interconnection details for above c) Cable block diagram	Vendor Vendor Vendor	- - -	Cable listing for Control and Instrumentation Cable in enclosed excel format shall be submitted by vendor during detailed engineering stage.
8	Equipment layout drawings	Vendor	-	
9	Electrical Equipment GA drawing	Vendor	-	For necessary interface review.

Annexure-II

बी एच ई एल BHEL	TECHNICAL SPECIFICATION ELEVATOR LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)	PE-TS-XXX-YYY-HZZZ Issue No: 01 Rev. No. 00 Date :

TECHNICAL DATA - PART - A

SL.NO	DESCRIPTION	UOM	DETAIL
1.0	**DESIGN CODES & STANDARDS**		
1.1	Three phase induction motors :		IS15999, IEC:60034, IS: 12615, IS: 325
1.2	Single phase AC motors		IS:996, IEC:60034
1.3	Energy Efficient motors		IS 12615, IEC:60034-30
1.4	Crane duty motors		IS:3177, IS/IEC:60034
1.5	Designation of Methods of Cooling of Rotating Electrical Machines		IS 6362
1.6	Designation for types of construction and mounting arrangement of rotating electrical machines		IS 2253
2.0	**DESIGN /SYSTEM PARAMETERS**		
2.1	Rated voltage	V	415
2.2	Frequency	Hz	50
2.3	Permissible variations for		
a)	Voltage	%	+/-10
b)	Frequency	%	(+)3 to (-)5
c)	Combined	%	10 (absolute sum)
2.4	System fault level at rated voltage for 1 sec	kA	50
2.5	Short time rating for terminal boxes for 0.25 sec	kA	50
2.6	Type of motors		(a) Squirrel cage induction motor suitable for Variable Voltage Variable Frequency (VVVF) application.
			(b) Motor operating through variable frequency drives shall be suitable for inverter duty with VPI insulation.
2.7	Rating		
a)	Motor duty		S4 duty, 40% cyclic duration factor
b)	Design margin over continous max. demand of the driven equipment (min)		10%
3.0	**CONSTRUCTION FEATURES**		
3.1	Winding and Insulation		Electrolytic grade Copper conductor, Non-hygroscopic, oil resistant, flame resistant Insulation.
3.2	Enclosure Details		
a)	Degree of protection		
	i) Indoor motors		IP 55
	ii) Outdoor motors		IP 55 (Additional Canopy to be provided)
b)	Method of ventilation		Totally enclosed fan cooled (TEFC) or totally enclosed tube or ventilated (TETV) or Closed air circuit air cooled (CACA) type.
3.3	Insulation		Class ‘F’ with temperature rise limited to class ‘B’
3.4	Bearings		-Grease lubricated ball or roller bearings for Horizontal motors Grease lubricated ball or roller bearings or combined trust and guide beaing for Vertical motors. -These motors shall be provided with insulated bearing on at least one side for motor frame size above 250 frame. However, supplier’s proven practice with respect to use of insulated bearing in VFD driven motor may be accepted subject to End customer’s approval.

3.5	Main terminal box		
a)	Type		-Motor terminal box shall be detachable type and located in accordance with Indian Standards clearing the motor base-plate/ foundation. -Terminals shall be stud or lead wire type, substantially constructed and thoroughly insulated from the frame. - The terminals shall be clearly identified by phase markings, with corresponding direction of rotation marked on the non-driving end of the motor.
b)	DOP		Same as motor
c)	Position when veiwed from the non driving end		Left hand side
d)	Rotation		90 Deg.
e)	Space heater		Motors rated 30KW and above shall have sapce heater. Separate terminal box for space heaters & RTDs shall be provided.
f)	Cable glands and lugs		-Motor terminal box shall be furnished with suitable cable lugs and double compression brass glands to match with cable used. -Gland plates of thickness 3 mm (hot/cold rolled sheet steel) or 4 mm (non magnetic material for single core cables) shall be provided in case of cable boxes.
3.6	Earthing points suitable for conenction		Motor body shall be grounded at two earthing points on opposite sides with two separate and distinct grounding pads complete with tapped holes, GI bolts and washers. LT Motors above 125 KW --- 50 x 6mm GS flat 25 KW to 125 KW --- 25 x 6mm GS flat 1KW to 25 KW --- 25 x 3mm GS flat
3.7	Paint shade (Corrosion proof paints of colour shade)		- RAL 5012 (Blue). -The thickness of finish coat shall be minimum 50 microns (minimum total DFT shall be 100 microns). However, in case electrostatic process of painting is offered. minimum paint thickness of 50 microns shall be acceptable for finish coat.Epoxy based paint with suitable additives shall be used.
3.8	Minimum spacing between gland plate & centre of bottom terminal stud		UP to 3 KW As per manufacturer's practice. Above 3 KW - upto 7 KW 85 mm Above 7 KW - upto 13 KW 115 mm Above 13 KW - upto 24 KW 167 mm Above 24 KW - upto 37 KW 196 mm Above 37 KW - upto 55 KW 249 mm Above 55 KW - upto 90 KW 277 mm Above 90 KW - upto 125 KW 331 mm Above 125 KW-upto 200 KW 385/203 (For Single core cables only) mm
3.9	Minimum inter-phase and phase-earth air clearances with lugs installed		UP to 110 KW 10mm Above 110 KW and upto 150 KW 12.5mm Above 150 KW 19mm
4.0	**PERFORMANCE PARAMETERS**		
4.1	Starting requirement		
a)	Minimum permissible voltage as a percentage of rated voltage, at start to bring the driven equipment upto the driven equipment upto rated speed		a) Up to 85% of rated voltage for ratings below 110 KW b) Up to 80% of rated voltage for ratings from 110 KW to 200 KW
b)	Maximum locked rotor current		as per IS 12615
c)	Starting duty		Two hot starts in succession, with motor initially at normal running temperature.

d)	The locked rotor withstand time under hot condition at highest voltage limit		a) atleast 2.5 secs. more than starting time(for motors with starting time upto 20 secs. at minimum permissible voltage during starting) b)atleast 5 secs. more than starting time(for motors with starting time more than 20 secs. and upto 45 secs. at minimum permissible voltage during starting) c) more than starting time by at least 10% of the starting time(For motors with starting time more than 45 secs.at minimum permissible voltage during starting) Speed switches mounted on the motor shaft shall be provided in cases where above requirements are not met.
e)	The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any further tolerance)		(a) From 50KW & upto 110KW : 11.0 (b) From 110 KW & upto 200 KW : 9.0
4.2	Torque (percent of full load torque)		1] Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque. 2]Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.
4.3	Noise level (max.)		85 dB(A)
4.4	Vibration shall be limited within the limits		as per IS:12075
5.0	**INSPECTION/TESTING**		
5.1	LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED. The following type test reports shall be submitted for each type and rating of LT motor of above 100 KW only. 1. Measurement of resistance of windings of stator and wound rotor. 2. No load test at rated voltage to determine input current power and speed 3. Open circuit voltage ratio of wound rotor motors (in case of Slip ring motors) 4. Full load test to determine efficiency power factor and slip 5. Temperature rise test 6. Momentary excess torque test. 7. High voltage test 8. Test for vibration severity of motor. 9. Test for noise levels of motor(Shall be limited as mentioned above.) 10. Test for degree of protection and 11. Overspeed test. 12. Type test reports for motors located in fuel oil area having flame proof enclosures as per IS 2148 / IEC 60079-1.		
5.2	The type test listed above should have been conducted within 10 yrs prior to supply under this contract. In absence of type tests reports or in case reports are not found to be meeting the specification/standards requirements, vendor shall conduct all such type tests without any commercial/delivery implication to BHEL according to the relevant standards and reports shall be submitted to the owner for approval.		
5.3	The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and “No design Change”. Minor changes if any shall be highlighted on the endorsement sheet.		
5.4	All acceptance and routine tests as per the specification and relevant standards shall be carried out.Charges for these shall be deemed to be included in the equipment price.		
5.5	For motor rating upto 50 KW, BHEL QP No. PE-QP-999-Q-006 Rev 02 is to be followed. For motor ratings above 50 kW NTPC Quality assurance plan will be followed.		

BHEL	**TECHNICAL SPECIFICATION FOR ELEVATOR (ELECTRICAL PORTION) LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)**	SPECIFICATION NO. PE-TS-XXX-XXX-AXXX VOLUME II B REV 01 DATE 03.06.2025 PAGE 1 OF 3

TECHNICAL SPECIFICATION OF CABLES

LT POWER CABLES

All LT power cables of sizes more than 120 sq.mm. shall be XLPE insulated, and sizes shall be of 1Cx150, 1Cx300, 1Cx630, 3Cx150, 3Cx185, 3Cx240& 3Cx300 Sq.mm. However for cable sizes upto 120 sq.mm. both XLPE insulated & PVC insulated LT power cables are acceptable.

1.1 KV grade XLPE power cables shall have multi stranded compacted aluminum conductor (tensile strength of more than 100 N/ sq.mm), XLPE insulated, PVC inner-sheathed (black color as per IS:5831), Armoured (For single core Armoured cables, armoring shall be of aluminum wires H4 grade. For multicore Armoured cables armouring shall be of galvanized steel round wire/strip), PVC FRLS outer-sheathed (black colour) conforming to IS: 7098. (Part-I).

1.1KV grade PVC power cables shall have multi stranded aluminum conductor (compacted type for sizes above 10 sq.mm), PVC Insulated, PVC inner sheathed ((black color as per IS:5831)) Armoured (For single core Armoured cables, armoring shall be of aluminum wires H4 grade. For multicore Armoured cables armouring shall be of galvanized steel round wire/strip), PVC FRLS outer-sheathed (black colour) conforming to IS:1554 (Part-I).

LT CONTROL CABLES

LT Control Cables are Cu conductor 1.5 sq mm, PVC insulated, PVC inner sheath, GS wire/strip armoured and FRLS PVC outer sheath confirming to IS 1554 Part-1.
Standard control cable sizes shall preferably be 3CX1.5, 5CX1.5, 7CX1.5 & 10CX1.5mm2, 14CX1.5 mm2.

TRAILING CABLES

1.1 kV grade trailing cables shall have tinned copper (class 5) conductor, insulated with heat resistant elastomeric compound based on Ethylene Propylene Rubber (EPR) suitable for withstanding 90 deg.C continuous conductor temperature and 250deg C during short circuit, inner sheathed with heat resistant elastomeric compound, nylon cord reinforced, outer-sheathed with heat resistant, oil resistant and flame retardant heavy duty elastomeric compound conforming to IS 9968.

CABLE SELECTION & SIZING

Cables shall be sized based on the following considerations:
a) Rated current of the equipment
b) The voltage drop in the cable, during motor starting condition, shall be limited to 10% and during full load running condition, shall be limited to 3% of the rated voltage.
c) Short circuit withstand capability
Derating factors for various conditions of installations (variation in ambient temperature, grouping of cables) shall be considered while cable sizing.

TECHNICAL SPECIFICATION OF CABLE TRAY AND SUPPORT SYSTEM

CABLE TRAYS

Cable trays shall be ladder/perforated type complete with matching fittings (like brackets, elbows, bends, reducers, tees, crosses, etc.) accessories (like side coupler plates, etc. and hardware (like bolts, nuts, washers, G.I. strap, hook etc.) as required. Cable tray shall be ladder type for power & control cables and perforated for instrumentation cables.

Cable trays, fittings and accessories shall be fabricated out of rolled mild steel sheets free from flaws such as laminations, rolling marks, pitting etc. These (including hardware) shall be hot dip galvanized.

Cable trays shall have standard width of 150 mm, 300 mm & 600 mm and standard lengths of 2.5 metre. Thickness of mild steel sheets used for fabrication of cable trays and fittings shall be 2 mm. The thickness of side coupler plates shall be 3 mm.

Cable troughs shall be required for branching out few cables from main cable route. These shall be U-shaped, fabricated of mild steel sheets of thickness 2 mm and shall be hot dip galvanised. Troughs shall be standard width of 50mm & 75 mm with depth of 25 mm.
The tolerance for cable tray and accessories shall be as per IS 2102 (Part-1). Tolerance Class: - Coarse

SUPPORT SYSTEM FOR CABLE TRAYS

Cable supporting steel work for cable racks/cables shall comprise of various channel sections, cantilever arms, various brackets, clamps, floor plates, all hardwares such as lock washers, hexagon nuts, hexagon head bolt, support hooks, stud nuts, hexagon head screw, channel nut, channel nut with springs, fixing studs, etc. All steel components, accessories, fittings and hardware shall be hot dip galvanized.

Cable tray support system shall be pre-fabricated out of single sheet. Support system for cable trays shall essentially comprise of the two components i.e. main support channel and cantilever arms. The main support channel shall be of two types : (i) C1:- having provision of supporting cable trays on one side and (ii) C2:-having provision of supporting cable trays on both sides.

The main support channel and cantilever arms shall be fabricated out of 2.5 thick rolled steel sheet conforming to IS 1079.
Cantilever arms of 320 mm, 620mm and 750 mm in length are required.

TECHNICAL SPECIFICATION OF CABLE GLANDS AND LUGS

Cable glands shall conform to BS:6121. Cable glands shall be made of heavy duty brass machine finished and nickel chrome plated. Thickness of plating shall not be less than 10 micron. All washers and Hardware shall also be made of brass with nickel chrome plating. Rubber components shall be of neoprene or better synthetic material and of tested quality.

Cable lugs/ferrules shall be solderless crimping type suitable for power and control cables as per the DIN 46239. Aluminium solderless crimping lugs/ ferrules shall be used for Aluminium cables and Copper lugs/ferrules shall be used for Copper cables. Bimetallic washers or bimetallic type lugs shall be used for bimetallic connections

BHEL	TECHNICAL SPECIFICATION ELEVATOR LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)	PE-TS-XXX-YYY-HZZZ Issue No: 01 Rev. No. 00 Date :

TECHNICAL DATA - PART - B (SUPPLIER DATA TO BE FURNISHED AFTER AWARD OF CONTRACT)

SL.NO		UOM	DETAIL
1.0	**GENERAL**		
i)	Manufacturer & Country of origin.		
ii)	Equipment driven by motor)		
iii)	Motor type		
iv)	Country of origin		
v)	Quantity	nos.	
2.0	**DESIGN AND PERFORMANCE DATA**		
i)	Frame size		
ii)	Type of duty		
iii)	Type of enclosure and method of cooling		
vi)	Type of mounting		
vii)	Direction of rotation as viewed from DE END		
viii)	Standard continuous rating at 40 deg.C. ambient temp. as per Indian Standard	(KW)	
ix)	(A) Derated rating for specified normal condition i.e. 50 deg. C ambient temperature	(KW)	
	(B) Rating as specified in load list	(KW)	
xi)	Rated speed at rated voltage and frequency	rpm	
xii)	At rated Voltage and frequency		
	a) Full load current	A	
	b) No load current	A	
xiii)	Power Factor at		
	a) 100% load		
	b) At duty point		
	c) 75% load		
	d) 50% load		
	e) NO load		
	f) Starting.		
xiv)	Efficiency at rated voltage and frequrecy		
	a) 100% load		
	b) At duty point		
	c) 75% load		
	d) 50% load		
xv)	Starting current*(inclusive of IS tolerance)* at		
	a. 100 % voltage	A	
	b. Minimum starting voltage	A	
xvi)	Starting time with minimum permissible voltage		
	a. Without driven equipment coupled	sec	
	b. With driven equipment coupled	sec	
xvii)	Safe stall time with 110% of rated voltage		
	a. From hot condition	sec	
	b. From cold condition	sec	

xviii)	**Torques :**		
	a. Starting torque at min. permissible voltage	(kg-mtr.)	
	b. Pull up torque at rated voltage.	(kg-mtr.)	
	c. Pull out torque	(kg-mtr.)	
	d. Min accelerating torque available	(kg-mtr.)	
	e. Rated torque	(kg-mtr.)	
xix)	Stator winding resistance per phase (at 20 Deg.C.)	Ohm	
xx)	GD^2 value of motors		
xxi)	Locked rotor KVA input (at rated voltage)		
xxii)	Locked rotor KVA/KW.		
xxiii)	**Bearings**		
	a. Type		
	b. Manufacturer		
	c. Self Lubricated or forced Lubricated		
	d. Recommended Lubricants		
	e. Guaranteed Life in Hours		
	f. Whether Dial Type thermometer provided		
	g. Oil pressure Gauge/switch		
	i. Range		
	ii. Contact Nos. & ratings		
	iii. Accuracy		
xxiv)	**Vibration**		
	a) Velocity	mm/s	
	b) Displacement	microns	
xxv)	Noise level	db	
3	**CONSTRUCTIONAL FEATURES**		
i	Stator winding insulation		
	a. Class & Type		
	b. Tropicalised (Yes/No)		
	c. Temperature rise over specified max.		
	i. Cold water temperature of 38 DEG. C.		
	ii. Ambient Air 50 DEG. C.		
	d. Method of temperature measurement		
	e. Stator winding connection		
	f. Number of terminals brought out		
ii	Type of terminal box for		
	a. stator leads		
	b. space heater		
	c. Temperature detectors		
	d. Instrument switch etc.		
iii)	For main terminal box		
	a. Location		
	b. Entry of cables		
	c. Recommended cable size		
	d. Fault level	MVA	

iv)	Temperature detector for stator winding		
	a Type		
	b. Nos. provided		
	c . Location		
	d. Make		
	e. Resistance value at 0 deg. C	ohms	
vi)	Paint shade		
vii).	Weight of(approx)		
	a. Motor stator (KG)		
	b. Motor Rotor (KG)		
	c. Total weight (KG)		
4	Relevant motor curves		

FOR MOTORS
UPTO 50 KW

ANNEXURE V

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :	DATE:
		CUSTOMER :		QP NO.: PE-QP-999-Q-006, REV-02	DATE: 17.04.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: AC ELECT. MOTORS UPTO 55KW (LV (415V))	SYSTEM:	SECTION: II	SHEET 1 of 2

S. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	D	**			
					M	C/ N					M	C	N	
1.0	ASSEMBLY	1.WORKMANSHIP	MA	VISUAL	100%	-	MFG. SPEC.	MFG. SPEC.	LOG BOOK		P	-	-	
		2.DIMENSIONS	MA	VISUAL	100%	-	MFG. DRG./ MFG. SPEC.	MFG. DRG./ MFG. SPEC.	LOG BOOK		P	-	-	
		3.CORRECTNESS COMPLETENESS TERMINATIONS/ MARKING/ COLOUR CODE	MA	VISUAL	100%	-	MFG.SPEC./	MFG.SPEC.	LOG BOOK		P	-	-	
2.0	PAINTING	1.SHADE	MA	VISUAL	SAMPLE	-	MFG. SPEC/ APPROVED DATASHEET	MFG. SPEC/ APPROVED DATASHEET	LOG BOOK	✓	P	V	-	
3.0	TESTS	1.ROUTINE TEST INCLUDING SPECIAL TEST	MA	VISUAL	100%	-	IS-325 / IS-12615/ APPROVED DATA SHEET	IS-325 / IS-12615/ APPROVED DATA SHEET	TEST/ INSPN. REPORT	✓	P	V *	-	* NOTE -1
		2.OVERALL DIMENSIONS & ORIENTATION	MA	MEASUREMENT & VISUAL	100%	-	APPROVED DRG/ DATA SHEET	APPROVED DRG/ DATA SHEET	TEST/ INSPN. REPORT	✓	P	V *	-	* NOTE -1 & NOTE-2

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	HEMA KUSHWAHA	HEMA KUSHWAHA	Checked by:		KUNAL GANDHI			Reviewed by:			
Reviewed by:	PRAVEEN DUTTA	PRAVEEN DUTTA	Reviewed by:	RITESH KUMAR JAISWAL	RITESH KUMAR JAISWAL			Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :	DATE:
		CUSTOMER :		QP NO.: PE-QP-999-Q-006, REV-02	DATE: 17.04.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: AC ELECT. MOTORS UPTO 55KW (LV (415V))	SYSTEM:	SECTION: II	SHEET 2 of 2

		3.NAMEPLATE DETAILS	MA	VISUAL	100%	-	IS-325 / IS-12615 / APPROVED DATA SHEET	SAME AS COL. 7	TEST/ INSPN. REPORT	✓	P	V	-	
4.0	PACKING	SURFACE FINISH & COMPLETENESS	MA	VISUAL	100%	100%	AS PER MFG. STANDARD / (#)	AS PER MFG. STANDARD / (#).	INSPC. REPORT	✓	P	W	-	(#) REFER NOTE-8

NOTES:
1. Routine tests on 100% motors shall be done by the vendor. However, BHEL/ Customer shall witness routine tests on random samples. The sampling plan shall be mutually agreed upon.
2. For exhaust/ventilation fan motors of rating up to 1.5 KW, only routine test certificates shall be furnished for scrutiny.
3. In case test certificates for these tests on similar type, size and design of motor from independent laboratory are available, the same is valid for 5 years.
4. BHEL reserves the right to perform repeat test, if required.
5. After packing and prior to issue MDCC, photographs of items to be despatched shall be sent to BHEL for review.
6. In case of any changes in QP commented by customer at contract stage, same shall be carried out by bidder without any implication to BHEL/ Customer.
7. Project specific QP to be developed based on customer requirement.
8. For export job, BHEL technical specification for seaworthy packing to be followed.
9. Packing shall be suitable for storage at site in tropical climate conditions.
10. Latest revision/ year of issue of all the standards (IS/ ASME/ IEC etc.) indicated in QP shall be referred.

LEGENDS:

*RECORDS, INDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION,
** **M**: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, **C**: CUSTOMER,
P: PERFORM, **W**: WITNESS, **V:** VERIFICATION, AS APPROPRIATE
MA: MAJOR, **MI**: MINOR**, CR:** CRITICAL
D: DOCUMENTATION

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:	HEMA KUSHWAHA	HEMA KUSHWAHA	Checked by:		KUNAL GANDHI
Reviewed by:	PRAVEEN DUTTA	PRAVEEN DUTTA	Reviewed by:	RITESH KUMAR JAISWAL	RITESH KUMAR JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

INDICATIVE SUB-VENDOR LIST
LARA SUPER THERMAL POWER PROJECT
STAGE-II (2x800 MW)

ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR NAME	ADDRESS	PHONE	REMARKS
LT MOTOR	1	ABB	FARIDABAD		UPTO 55KW
	2	ABB	BANGALORE		
	3	JYOTI LTD.	VADODARA		
	4	TIPM	JAPAN		UPTO 15 KW (NON FLAME PROOF)
	5	HYOSUNG	SOUTH KOREA		
	6	WEG	BRAZIL		
	7	HYUNDAI	SOUTH KOREA		
	8	LHP	SOLAPUR		
	9	CGL	AHMEDNAGAR		RQP, FOR FLAME PROOF MOTOR
	10	TMEIC	JAPAN (NAGASAKHI)		
	11	NGEF	BANGALORE		UPTO 15 KW
	12	BHARAT BIJLEE	MUMBAI		RQP, FOR FLAME PROOF ALSO
	13	KEC	BANGALORE/ HUBLI*		*UPTO 90KW, RQP, FOR FLAME PROOF ALSO
	14	MARATHON	KOLKATA		RQP (UPTO 690V & 600 KW) FOR FLAME PROOF ALSO
	15	ABB	SWEDEN		UPTO 55KW
	16	HAVELL	NEEMRANA		UP TO 90KW
	17	KAWAMATA	JAPAN		UP TO 75 KW
	18	TIPS	JAPAN		UP TO 45KW
LT POWER CABLE Type- XLPE Insulated, PVC sheathed (incl FRLS)	1	Advance Cable	Bengaluru		
	2	Apar Industries Ltd	Umbergaon		
	3	Cords Cables	Bhiwadi		
	4	CMI	Baddi		
	5	Delton Cable Ltd	Faridabad		
	6	Dynamic Cables	Jaipur		
	7	Gemscabs Industries	Bhiwadi		
	8	Gupta Power Cables	Khurda		
	9	Havells India Ltd.	Alwar		
	10	KEC International	Silvassa , Mysore		
	11	KEI Industries	Bhiwadi		
	12	Paramount Cable	Khushkhera		
	13	Polycab Wires Pvt. Ltd	Daman		
	14	Ravin Cables	Pune		
	15	Special Cables	Rudrapur		
	16	Suyog Cables	Vadodara		
	17	Thermocables	Hyderabad		
	18	Tirupati Plastomatics	Jaipur		
	19	Torrent Cable Ltd	Nadiad		
	20	Universal Cable Ltd.	Satna		
LT Control Cable 1.1 KV, Type - PVC (incl FRLS)	1	Advance Cable	Bengaluru		
	2	Apar Industries Ltd	Umbergaon		
	3	Cords Cables	Bhiwadi		
	4	CMI	Faridabad		
	5	CMI	Baddi		
	6	Delton Cable Ltd	Faridabad		
	7	Elkay Telelink	Faridabad		
	8	Gemscabs Industries	Bhiwadi		
	9	Goyoline Fibres (I) Ltd	Daman		
	10	Gupta Power Cables	Khurda		
	11	Havells India Ltd.	Alwar		
	12	KEC International	Silvassa , Mysore		
	13	KEI Industries	Bhiwadi		
	14	Paramount Cable	Khushkhera		
	15	Polycab Wires Pvt. Ltd	Daman		
	16	Ravin Cables	Pune		
	17	Special Cables	Rudrapur		
	18	Suyog Cables	Vadodara		
	19	Thermocables	Hyderabad		
	20	Tirupati Plastomatics	Jaipur		
	21	Torrent Cable Ltd	Nadiad		
	22	Universal Cable Ltd.	Satna		
GI CONDUITS	BIS APPROVED MAKE				
GI CONDUIT (EPOXY PAINTED)	BIS APPROVED MAKE				
FLEXIBLE CONDUITS (LEAD COATED)	1	PLICA INDIA PVT. LTD.	V.P.AGARWAL MANAGING DIRECTOR, PLICA INDIA PVT. LTD. 149, MODEL TOWN EAST GHAZIABAD - 201009	M - 9810052131 / 0120-4563979 / 9810557567 Mail: agr@plicaindia.com	

FLEXIBLE CONDUIT (PVC COATED)	REPUTED MAKE				
CABLE GLANDS	1	ALLIED TRADERS & EXPORTERS	C-124 A, SECTOR-2, NOIDA -201 301, UTTAR PRADESH, INDIA	Mr. Vijay Mohan Sood +(91)-(120)-2525694 +(91)-(120)-3052594 +(91)-(11)-23287156 vijay_mohansood@yahoo.com	
CABLE GLANDS	2	ARUP ENGG & FOUNDARY WORKS	391/119,PRINCE ANWAR SHAH ROAD, CALCUTTA-700068	033 2473 0850	
CABLE GLANDS	3	BALIGA LIGHTING EQPT.PVT.LTD.	63A,CP RAMASWAMY ROAD, ALWARPET,P.B.No 6910, CHENNAI-600018	44-24995505,22680990-4	
CABLE GLANDS	4	COMMET BRASS PRODUCTS	NUTAN CHEMICAL COMPOUND, WALBHAT ROAD, GOREGAON, MUMBAI-400063	91-022-26852961/62/63 comet@vsnl.net	
CABLE GLANDS	5	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/ 022-29270878.	
CABLE GLANDS	6	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059	91-22-28324829 / 66919034 devang@electromacglands.com	
CABLE GLANDS	7	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
CABLE LUGS	1	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/ 022-29270878.	
CABLE LUGS	2	UNIVERSAL MACHINES LTD.	4,B.B.D.BAG (EAST) 90,STEPHEN HOUSE,5TH FLR CALCUTTA-700001	033 2282 2540	
CABLE CLAMPS & CABLE TIES	1	ELECTROMAC IND.CORPN.	27/28 AF,NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E), MUMBAI-400059	91-22-28324829 / 66919034/ Mr. Devang Patel/ 91-9867074600 devang@electromacglands.com	
CABLE CLAMPS & CABLE TIES	2	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
CABLE CLAMPS & CABLE TIES	3	NOVOFLEX MARKETING PVT. LTD.	RAIKVA' - 5TH FLOOR, UNIT-6 3A, RAM MOHAN MULLICK GARDEN LANE KOLKATA - 700 010	Phone: +91 33 2372 0088 Email: sales@novoflex.co.in, novoflexcal@vsnl.net	
AC LOAD BREAK SWITCH	1	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
AC LOAD BREAK SWITCH	2	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
AC LOAD BREAK SWITCH	3	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
AC LOAD BREAK SWITCH	4	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014	Rajiv Sharma-9312004687	
AC LOAD BREAK SWITCH	5	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
CONTROL SWITCHES/ SELECTOR SWITCH	1	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014	Rajiv Sharma-9312004687	
CONTROL SWITCHES/ SELECTOR SWITCH	2	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
CONTROL SWITCHES/ SELECTOR SWITCH	3	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479000	
CONTROL SWITCHES/ SELECTOR SWITCH	4	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
CONTROL SWITCHES/ SELECTOR SWITCH	5	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213		
CONTROL SWITCHES/ SELECTOR SWITCH	6	RECOM PVT. LTD.	M/S RECOM PVT. LTD.,16A , 2ND FLOOR A, WING RAJ INDUSTRIAL COMPLEX, MILITARY ROAD , MAROL ANDHERI (EAST),MUMBAI ,MAHARASHTRA STATE : 400059	Mr. Chandrashekar Kamath (MD) : 09820249503	
LIGHTING SWITCH , SOCKET & S/F UNIT	1	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
LIGHTING SWITCH , SOCKET & S/F UNIT	2	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
LIGHTING SWITCH , SOCKET & S/F UNIT	3	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014	Rajiv Sharma-9312004687	
LIGHTING SWITCH , SOCKET & S/F UNIT	4	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
LIGHTING SWITCH , SOCKET & S/F UNIT	5	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
LIGHTING SWITCH , SOCKET & S/F UNIT	6	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	

MODULAR SWITCH BOARD	1	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
MODULAR SWITCH BOARD	2	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
MODULAR SWITCH BOARD	3	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
SWITCH BOX	1	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
SWITCH BOX	2	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
SWITCH BOX	3	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
SWITCH BOX	4	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC. , TTC INDL. AREA, NAVI MUMBAI – 400705.	Tel : 022 27620299 / 97 / 96 'mail@ajmera.net	
SWITCH BOX	5	S.B. ELECTRICAL ENGINEERING CORPORATION	03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002	022- 22069831; 022-66637259	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	1	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	2	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	3	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	4	LOGICSTAT	B-160, INDUSTRIAL AREA, C BLOCK RD, OKHLA I, OKHLA INDUSTRIAL AREA, NEW DELHI, DL 110020	011 2681 0032	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	5	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	6	UNILEC ENGINEERS PVT. LTD.	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	7	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	FOR CONTROL TRANSFORMER ONLY
MCB	1	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE	011 - 25793021	
MCB	2	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
MCB	3	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
MCB	4	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004	044 - 24988056, 044 - 24988057, 044 - 24988058	
AUXILIARY RELAYS	1	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
AUXILIARY RELAYS	2	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
AUXILIARY RELAYS	3	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
AUXILIARY RELAYS	4	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA	Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com	
AUXILIARY RELAYS	5	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
BIMETAL RELAYS	1	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
BIMETAL RELAYS	2	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
BIMETAL RELAYS	3	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	

BIMETAL RELAYS	4	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
FUSE BASE	1	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
FUSE BASE	2	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
FUSE BASE	3	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
FUSE BASE	4	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
FUSE BASE	5	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
FUSE BASE	6	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
FUSE BASE	7	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
FUSE BASE	8	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
FUSE BASE	9	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
FUSE BASE	10	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
HRC FUSES	1	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
HRC FUSES	2	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
HRC FUSES	3	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
HRC FUSES	4	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
HRC FUSES	5	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
HRC FUSES	6	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
HRC FUSES	7	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
HRC FUSES	8	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
HRC FUSES	9	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
HRC FUSES	10	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
AC CONTACTORS	1	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
AC CONTACTORS	2	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
AC CONTACTORS	3	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
AC CONTACTORS	4	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
AC CONTACTORS	5	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	

SECTION – B

DRAWINGS / DOCUMENTS TO BE SUBMITTED WITH THE BID

Bidder shall submit the following drawings / documents along with their bid:

a) Un-priced copy of price format indicating quoted/ not quoted against each row/column
b) Signed/ Stamped copy of Compliance cum Confirmation Certificate
c) Copy of pre-bid clarifications/ amendment/ corrigendum issued by BHEL, if any, duly signed & stamped.
d) Deviation schedule with reference to specific clauses of the specification along with reason for such deviation in the 'Deviation Schedule' (Cost of withdrawal) format as attached in GCC.
e) Electrical Load List

OFFER WILL BE CONSIDERED AS INCOMPLETE IN ABSENCE OF ANY OF ABOVE DOCUMENTS. DOCUMENT OTHER THAN ABOVE, IF ANY, SUBMITTED WITH THE OFFER WILL NOT FORM PART OF CONTRACT AND WILL NOT BE CONSIDERED FOR BID EVALUATION.

1.1 COMPLIANCE CUM CONFIRMATION CERTIFICATE

The bidder shall confirm compliance with following by signing / stamping this compliance certificate (every sheet) and furnish same with the offer.

a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions, other than those mentioned under "exclusion and those resolved as per 'Schedule of Deviations', with regard to same.

b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'

c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL / CUSTOMER approval & customer hold points for inspection / testing shall be marked in the QP at the contract stage. Inspection / testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This is within the contracted price without any extra implications to BHEL after award of the contract.

d) All drawings/ data-sheets / calculations etc. submitted along with the offer shall not be taken cognizance off.

e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified / intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre-bid discussions, otherwise BHEL / Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.

g) All sub vendors shall be subject to BHEL / CUSTOMER approval in the event of order.

h) Guarantee for plant/equipment shall be as per relevant clause of GCC / SCC / Other Commercial Terms & Conditions

i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price even if the same are additional

to approved billing break up, approved drawing or approved Bill of quantities within the scope of work as tender specification. This clause will apply in case during site commissioning, additional requirements emerges due to customer and / or consultant's comments. No extra claims shall be put on this account

j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's / Customer's / Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.

k) As built drawings shall be submitted as and when required during the project execution.

l) The bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.

m) Successful bidder shall furnish detailed erection manual for each of the equipment supplied under this contract at least 3 months before the scheduled erection of the concerned equipment / component or along with supply of concerned equipment / component whichever is earlier.

n) Document approval by customer under Approval category or information category shall not absolve the vendor of their contractual obligations of completing the work as per specification requirement. Any deviation from specified requirement shall be reported by the vendor in writing and require written approval. Unless any change in specified requirement has been brought out by the vendor during detail engineering in writing while submitting the document to customer for approval, approved document (with implicit deviation) will not be cited as a reason for not following the specification requirement.

o) In case vendor submits revised drawing after approval of the corresponding drawing, any delay in approval of revised drawing shall be to vendor's account and shall not be used as a reason for extension in contract completion.

PRE-BID CLARIFICATION SCHEDULE

S. No.	Section/Clause /Page No.	Statement of the referred clause	Clarification Required

The bidder hereby certifies that above mentioned are the only clarifications required on the technical specification for the subject package.

SIGNATURE: _____

NAME: _____

DESIGNATION: _____

COMPANY: _____

DATE: _____

COMPANY SEAL

DEVIATION SHEET (COST OF WITHDRAWL)

PROJECT:- 2X800 MW LARA TPS.

PACKAGE:- ELEVATOR

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWL OF DEVIATION (POSITIVE/ NEGATIVE)	REASON FOR QUOTING DEVIATION
TECHNICAL DEVIATIONS									
COMMERCIAL DEVIATIONS									

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	**DESIGNATIONS**	**SIGN & DATE**	

NOTES:

1. For self manufactured items of bidder, cost of withdrawl of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. For directly dispatchable items, cost of withdrawl of deviation will be applicable on the basic price including taxes, duties & freight.
3. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
4. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
5. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawl of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.
6. Bidder shall furnish price copy of above format along with price bid.
7. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
8. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
9. For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawl of deviation shall be taken as NIL.
10. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
11. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
12. Cost of withdrawl is to be given seperately for each deviation. In no event bidder should club cost of withdrawl of more than one deviation else cost of withdrawl of such deviations which have been clubbed together shall be considered as NIL.
13. In case nature of cost of withdrawl (positive/negative) is not specified it shall be assumed as positive.
14. In case of descrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

LOAD TITLE	RATING (KW)		UNIT (U)/STN (S)	Nos.		VOLTAGE CODE*	FEEDER CODE**	EMER. LOAD (Y)	CONT.(C)/ INTT.(I)	STARTING TIME >5 SEC (Y)	LOCATION	BOARD NO.	CABLE		BLOCK CABLE DRG. No.	CONTROL CODE	REMARKS	LOAD No.
	NAME PLATE	MAX. CONT. DEMAND (MCR)		RUNNING	STANDBY								SIZE CODE	NOs				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TG BUILDING ELEVATOR																		
ELEVATOR MOTOR	16.5		S	2	0	D	S	-	C		TG Building Elevator Machine Room							
SPLIT AIR-CONDITIONER FOR ELEVATOR M/C ROOM AND LIGHTING FOR ELEVATOR M/C ROOM & SHAFT AND MAINTENANCE AND INSTALLATION REQUIREMENT	7		S	2	0	D	S	-	C		TG Building Elevator Machine Room							
ESP CONTROL ROOM BUILDING ELEVATOR																		
ELEVATOR MOTOR	16.5		S	2	0	D	S	-	C		ESP Control Room Building Elevator Machine Room							
SPLIT AIR-CONDITIONER FOR ELEVATOR M/C ROOM AND LIGHTING FOR ELEVATOR M/C ROOM & SHAFT AND MAINTENANCE AND INSTALLATION REQUIREMENT	7		S	2	0	D	S	-	C		ESP Control Room Building Elevator Machine Room							

NOTES:

1. COLUMN 1 TO 12 & 18 SHALL BE FILLED BY THE REQUISITIONER (ORIGINATING AGENCY); REMAINING COLUMNS ARE TO BE FILLED UP BY PEM (ELECTRICAL)
2. ABBREVIATIONS : * VOLTAGE CODE (7):- (ac) A=11 KV, B=6.6 KV, C=3.3 KV, D=415 V, E=240 V (1 PH), F=110 V (DC): G=220 V, H=110 V, J=48 V, K=+24V, L=-24 V
   : ** FEEDER CODE (8):- U=UNIDIRECTIONAL STARTER, B=BI-DIRECTIONAL STARTER, S=SUPPLY FEEDER, D=SUPPLY FEEDER (CONTACTER CONTROLLED)

BHEL	**LOAD DATA (ELECTRICAL)**	JOB NO.	508	ORIGINATING AGENCY		PEM (ELECTRICAL)
		PROJECT TITLE	LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)	NAME		DATA FILLED UP ON
		SYSTEM / S	ELEVATORS	SIGN.		DATA ENTERED ON
		DEPTT. / SECTION	MAUX / MH	SHEET 1 OF 2	REV. 00	DE'S SIGN. & DATE

LOAD TITLE	RATING (KW)		UNIT (U)/STN (S)	Nos.		VOLTAGE CODE*	FEEDER CODE**	EMER. LOAD (Y)	CONT.(C)/ INTT.(I)	STARTING TIME >5 SEC (Y)	LOCATION	BOARD NO.	CABLE		BLOCK CABLE DRG. No.	CONTROL CODE	REMARKS	LOAD No.
	NAME PLATE	MAX. CONT. DEMAND (MCR)		RUNNING	STANDBY								SIZE CODE	NOs				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Note:

1) No other single phase or 3 phase supply shall be provided for elevator erection / operation etc.
2) Only two nos. (3 phase) supply feeders per elevator shall be provided one feeder shall be dedicated to elevator motor and other 3 phase supply feeder shall be provided by BHEL for air conditioner, machine room and shaft lighting and maintenance / installation requirement. Bidder to consider CT in their scope for stepping down the voltage as per their requirement.

Bidder to note: Feeder of indicated rating shall be provided by BHEL. If motor rating is lesser than the provided feeder rating, bidder shall provide protection against over current

NOTES:

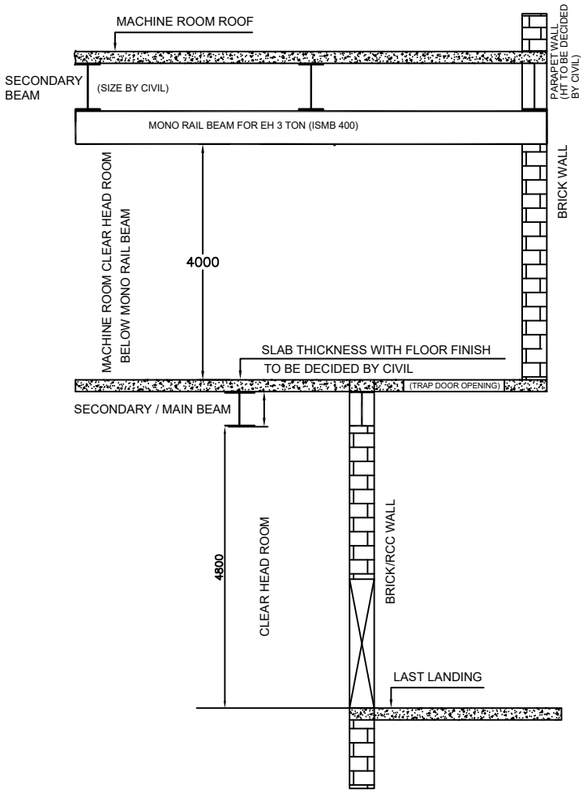
1. COLUMN 1 TO 12 & 18 SHALL BE FILLED BY THE REQUISITIONER (ORIGINATING AGENCY); REMAINING COLUMNS ARE TO BE FILLED UP BY PEM (ELECTRICAL)
2. ABBREVIATIONS : * VOLTAGE CODE (7):- (ac) A=11 KV, B=6.6 KV, C=3.3 KV, D=415 V, E=240 V (1 PH), F=110 V (DC): G=220 V, H=110 V, J=48 V, K=+24V, L=-24 V
   : ** FEEDER CODE (8):- U=UNIDIRECTIONAL STARTER, B=BI-DIRECTIONAL STARTER, S=SUPPLY FEEDER, D=SUPPLY FEEDER (CONTACTER CONTROLLED)

भेल BHEL	**LOAD DATA (ELECTRICAL)**	JOB NO.	508	ORIGINATING AGENCY		PEM (ELECTRICAL)
		PROJECT TITLE	LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)	NAME		DATA FILLED UP ON
		SYSTEM / S	ELEVATORS	SIGN.		DATA ENTERED ON
		DEPTT. / SECTION	MAUX / MH	SHEET 2 OF 2	REV. 00	DE'S SIGN. & DATE

ANNEXURE-B

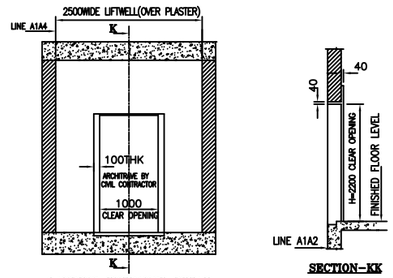
Input Drawings By BHEL

ELEVATION ON MACHINE ROOM



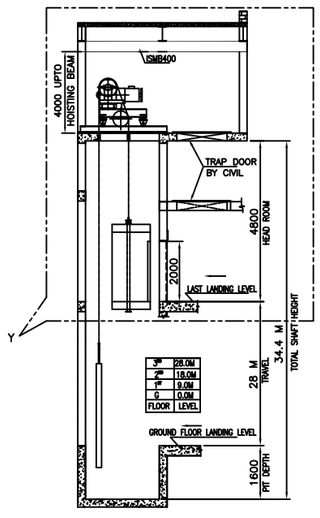
DETAIL–Y

STANDARD DETAILS OF SHAFT



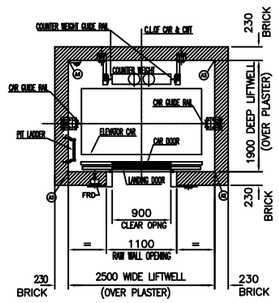
LANDING ENTRANCE DETAIL
(VIEW FROM LIFT WELL OUTSIDE)
(TYPICAL FOR ALL FLOORS)

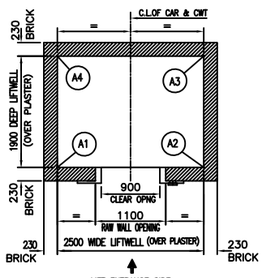
SECTION–KK



ELEVATIONAL DETAILS
(NOT FOR SCALE)

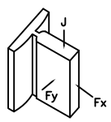
STANDARD DETAILS OF PIT





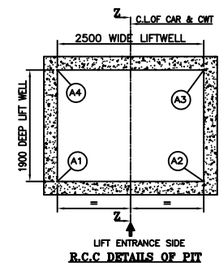
PLAN ON LIFTWELL

FORCES ON CAR & CWT GUIDE RAIL	
Fx	1300 N
Fy	600 N
J	23000 N

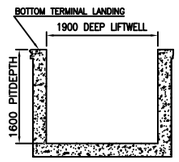


GUIDE RAIL FORCES

PLAN ON LIFTWELL– TYPICAL LOCATION OF GUIDERAILS FOR CAR & COUNTERWEIGHT

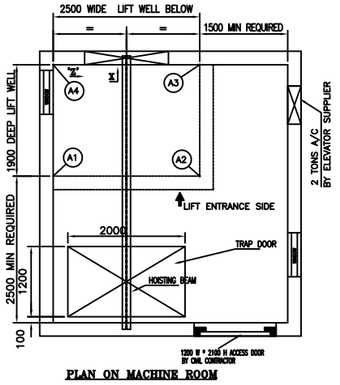


R.C.C DETAILS OF PIT

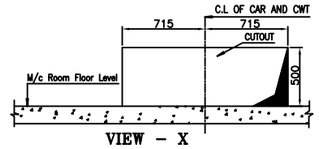


SECTION ZZ

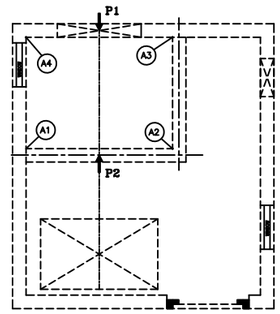
STANDARD DETAILS OF MACHINE ROOM



PLAN ON MACHINE ROOM

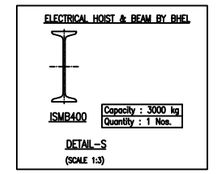


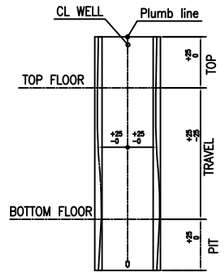
VIEW – X



LOAD POSITION ON M/C ROOM PLAN

Point	Dynamic Load (Kg)
P1	16000
P2	8000





WELL TOLERANCES
(NOT FOR SCALE)

S.NO	AREA	SCOPE	DESCRIPTION OF WORK	AGENCY
1	PIT	CIVIL	PIT LADDER AND SCAFFOLDING IN ELEVATOR SHAFT.	BY VENDOR
2	PIT	CIVIL	PIT SHALL BE MADE DRY AND WATER PROOF.	BY CIVIL CONTRACTOR
3	PIT	CIVIL	BARE PIT SHALL BE PROVIDED. SUPPORTING MS STRUCTURE FOR CAR & CW BUFFER SHALL BE PROVIDED BY VENDOR.	BY VENDOR
4	PIT	CIVIL	PIT SLAB SHALL BE CASTED TO TAKE CARE OF CAR & COUNTERWEIGHT BUFFER LOADS (MAX. LOAD OF 21T) AS THE POSITION OF LOAD & STRUCTURED BUFFER IS VENDOR SPECIFIC . HENCE, CIVIL CONTRACTOR SHALL SIZE THE SLAB THICKNESS ACCORDINGLY WRT TOTAL LOAD OF 21T.	BY CIVIL CONTRACTOR
5	ELEVATOR CAR	ELECTRICAL	ELEVATOR CAR LIGHTING	BY VENDOR
6	ELEVATOR CAR	MECHANICAL	1/2 Kg CO / SUITABLE TYPE FIRE EXTINGUISHER ALONG WITH FIXING ARRANGEMENT.	BY VENDOR
7	AT EVERY LANDING	CIVIL	POCKET CUTTING / HOLES FOR LOP, FRD, LANDING DISPLAY & ANY OTHER FOR EVERY LANDING LEVEL SHALL BE DONE BY VENDOR.	BY VENDOR
8	AT EVERY LANDING	CIVIL	GROUTING FOR LOP, FRD, LANDING DISPLAY & ANY OTHER FOR FIXATION AT EVERY LANDING LEVEL SHALL BE DONE BY VENDOR.	BY VENDOR
9	ELEVATOR SHAFT	CIVIL	SHAFT WHITE WASHING.	BY CIVIL CONTRACTOR
10	ELEVATOR SHAFT	CIVIL	ALL ANCHOR BOLTS FOR FIXING GUIDE BRACKET AND BEAMS IN MACHINE ROOM.	BY VENDOR
11	ELEVATOR SHAFT	CIVIL	LIFT SHAFT HAS TO BE IN THE PLUMB LINE WITH A LIMIT OF -0 +25MM.	BY CIVIL CONTRACTOR
12	ELEVATOR SHAFT	ELECTRICAL	BULK HEAD FITTINGS OF MINIMUM 60 WATTS/ 18W CFL SHALL BE PROVIDED AT EVERY 3 METERS AND A PLUG POINT 15A/5A, 3 PIN AT EVERY 6 METERS-ADJACENT TO THE BULK HEAD FITTINGS. THE POSITION SHOULD BE AT ANY CORNER OF THE WALL OF COUNTER WEIGHT.	BY VENDOR
13	ELEVATOR SHAFT	ELECTRICAL	FIREMAN SWITCH & PIT SWITCHES.	BY VENDOR
14	ELEVATOR SHAFT	MECHANICAL	WIRE MESH BETWEEN CAR & COUNTER WEIGHT.	BY VENDOR
15	MACHINE ROOM	CIVIL	ELEVATOR MACHINE ROOM SHALL BE DESIGNED AS PER THE LOAD REQUIREMENTS GIVEN IN THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
16	MACHINE ROOM	CIVIL	PROVIDE THE REQUIRED HOLES/ POCKETS FOR MAIN ROPES / OSG ROPES/ SHAFT ELECTRIFICATION IN THE MACHINE ROOM FLOOR AS PER THE DIMENSIONS GIVEN IN THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
17	MACHINE ROOM	CIVIL	THE MONORAIL BEAM (3 TONS) FOR HOISTING THE MACHINE & HOIST TO BE PROVIDED AS PER THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR (SUPPLY & ERECTION OF MONORAIL BEAM SHALL BE DONE BY CIVIL CONTRACTOR)
18	MACHINE ROOM	CIVIL	TRAP DOOR SHALL BE PROVIDED AS PER ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
19	MACHINE ROOM	CIVIL	SECONDARY BEAM ARRANGEMENT SHALL BE PERPENDICULAR TO MONORAIL BEAM.	BY CIVIL CONTRACTOR
20	MACHINE ROOM	CIVIL	STANDARD MACHINE ROOM DIMENSIONS AS REQUIRED ARE INDICATED IN THE DRAWING. TO SUIT CIVIL DESIGN WRT CIVIL STRUCTURE STABILITY, MACHINE ROOM SIZE CAN BE INCREASED (AS PER CIVIL REQUIREMENT) AND THEN SIZE OF MONORAIL BEAM(ISMB 400) AS MENTIONED IN DETAIL-Y VIEW SHALL BE FINALIZED BY CIVIL AGENCY.	BY CIVIL CONTRACTOR
21	MACHINE ROOM	CIVIL	PROPER ACCESS TO THE MACHINE ROOM SHALL BE PROVIDED AND IT SHOULD BE SAFE AND RIGID WITH HANDRAILS FOR ADEQUATE GRIP.	BY CIVIL CONTRACTOR
22	MACHINE ROOM	ELECTRICAL	THE MACHINE ROOM SHALL BE ADEQUATELY ILLUMINATED. THE MACHINE ROOM SHALL HAVE MINIMUM 200 LUX ILLUMINATION AT THE FLOOR LEVEL.	BY VENDOR
23	MACHINE ROOM	ELECTRICAL	CONVENIENT OUTLET (15A /5A) IN THE MACHINE ROOM TO BE PROVIDED FOR POWER TOOL USAGE.	BY VENDOR
24	MACHINE ROOM	ELECTRICAL	ONLY TWO (3 PHASE) SUPPLY FEEDERS PER ELEVATOR SHALL BE PROVIDED ONE FEEDER SHALL BE DEDICATED TO ELEVATOR MOTOR AND OTHER 3 PHASE SUPPLY FEEDER SHALL BE PROVIDED BY BHEL FOR AIR CONDITIONER, MACHINE ROOM AND SHAFT LIGHTING AND MAINTENANCE /INSTALLATION REQUIREMENT. VENDOR SHALL PROVIDE CT FOR STEPPING DOWN THE VOLTAGE AS PER THEIR REQUIREMENT.	BY ELECTRICAL CONTRACTOR **(VENDOR TO CONSIDER CT IN THEIR SCOPE FOR STEPPING DOWN THE VOLTAGE AS PER THEIR REQUIREMENT)**
25	MACHINE ROOM	ELECTRICAL	THE TERMINATION & TERMINATION BOX FOR THE FEEDERS SHALL BE PROVIDED.	BY VENDOR
26	MACHINE ROOM	ELECTRICAL	THE EARTHING LEADS / EARTH STRIPS SHALL BE PROVIDED NEAR ELEVATOR SHAFT AT GROUND FLOOR BY ELECTRICAL CONTRACTOR AND FROM GROUND FLOOR TO MACHINE ROOM SHALL BE ROUTED BY VENDOR.	BY ELECTRICAL CONTRACTOR & BY VENDOR
27	MACHINE ROOM	ELECTRICAL	EPABX CONNECTIVITY SHALL BE PROVIDED TILL MACHINE ROOM BY ELECTRICAL CONTRACTOR & FROM MACHINE ROOM TO ELEVATOR BY VENDOR	**BY ELECTRICAL CONTRACTOR & BY VENDOR**
28	MACHINE ROOM	MECHANICAL	SPLIT AC (MIN 2 TONS) TO BE PROVIDED IN THE EACH ELEVATOR MACHINE ROOM.	BY VENDOR
29	ELEVATOR SHAFT	CIVIL	ELEVATOR SHAFT SHALL BE OF CLAY BRICK (MIN. 230MM THK) OR R.C.C ONLY. (FLY ASH BRICKS NOT TO BE USED). LINTEL BEAM AT EVERY 2.3 M TO 2.5 M SHALL BE PROVIDED FOR COUNTER WEIGHT & CAR BRACKET FIXING.	BY CIVIL CONTRACTOR
30	ELEVATOR SHAFT	CIVIL	LIFT ENTRANCE SIDE WALL (ON ALL FLOORS) SHALL BE KEPT ON HOLD & SHALL BE CONSTRUCTED AFTER ORDERING/ RECEIVING INPUT FROM FINALLY SELECTED BIDDER. UPON LIFTING HOLD, FINAL WALL CONSTRUCTION SHALL BE DONE BY CIVIL CONTRACTOR ONLY.	BY CIVIL CONTRACTOR
31	ELEVATOR SHAFT	CIVIL	CLEAR HEADROOM OF 4.8M IS REQUIRED ABOVE LAST LANDING LEVEL OF ELEVATOR (EXCLUDING MACHINE ROOM SLAB THICKNESS & SECONDARY BEAM (IF ANY)). THE SAME IS TO BE ENSURED ACCORDINGLY BY CIVIL CONTRACTOR.	BY CIVIL CONTRACTOR
32	ELEVATOR SHAFT	CIVIL	IN CASE OF DUPLEX ARRANGEMENT OF ELEVATORS, WHERE ELEVATORS ARE PLACED SIDE BY SIDE, BRACKET OF GUIDE RAILS FOR BOTH THE ELEVATORS SHALL BE FIXED ON THE COMMON WALL BETWEEN BOTH LIFT SHAFTS. HENCE, THIS WALL MAY BE SUITABLY DESIGNED/ STRENGTHENED SO AS TO SUSTAIN REQUIRED GUIDE RAIL LOADS AS THIS WALL SHALL BE SUBJECT TO GUIDE RAIL FORCES FROM BOTH SIDES.	BY CIVIL CONTRACTOR
33	ELEVATOR SHAFT	CIVIL	DUMMY LANDING/S, ARE REQUIRED IN CASE TRAVEL BETWEEN TWO CONSECUTIVE LANDINGS IS MORE THAN 10 M, AS PER CODAL REQUIREMENT. HENCE, CORRESPONDING LANDING PLATFORMS & SUITABLE ACCESS LADDER/ STAIRS FOR DUMMY LANDING PLATFORMS ARE ALSO TO BE PROVIDE ACCORDINGLY.	BY CIVIL CONTRACTOR
34	ELEVATOR SHAFT	CIVIL	CIVIL LOADS SHALL BE TRANSFERRED TO WALLS (TYPICAL LOCATION AS SHOWN IN DRAWING). WALLS SHALL BE DESIGNED ACCORDINGLY.	BY CIVIL CONTRACTOR
35	MACHINE ROOM	CIVIL	CLEAR HEIGHT OF 4M IS REQUIRED IN THE ELEVATOR MACHINE ROOM BELOW MONORAIL BEAM (I.E. EXCLUDING MONORAIL BEAM (FOR ELECTRIC HOIST), SECONDARY BEAMS (IF ANY) & SLAB THICKNESS). HENCE, ELEVATION OF TOP OF MACHINE ROOM ROOF TO BE CALCULATED ACCORDINGLY BY CIVIL CONTRACTOR.	BY CIVIL CONTRACTOR
36	MACHINE ROOM	CIVIL	TRAP DOOR IS TO BE PLACED IN MACHINE ROOM TOWARDS ELEVATOR LANDING SIDE CONSIDERING THAT NO EQUIPMENTS/ OBJECTS SHALL BE LOCATED BELOW THE SAME AT LAST LANDING LEVEL FLOOR, ELSE IT WOULD CAUSE HINDRANCE IN MOVEMENT OF ELEVATOR MACHINERY OUT OF THE MACHINE ROOM DURING MAINTAINENCE.	BY CIVIL CONTRACTOR
37	PIT, SHAFT & MACHINE ROOM	CIVIL	NO PROJECTIONS ARE ALLOWED INSIDE THE LIFT SHAFT / PIT AND MACHINE ROOM. HENCE PLEASE ENSURE THAT ANY COLUMN / COLUMN FOUNDATIONS/ PLINTH BEAMS/ FLOOR SUPPORTING BEAMS SHOULD NOT BE PROJECTED INSIDE THE LIFT SHAFT/ PIT & ELEVATOR MACHINE ROOM.	BY CIVIL CONTRACTOR
38	MACHINE ROOM	CIVIL	MINIMUM REQUIREMENT OF MACHINE ROOM ALONG WITH TRAP DOOR ARE INDICATED HERE. HOWEVER PROJECT SPECIFIC REQUIREMENTS SHALL BE DISCUSSED ON CASE TO CASE BASIS.	BY CIVIL CONTRACTOR

NOTE: ALL DIMENSIONS ARE IN MM

CUSTOMER: .	NTPC
CONSULTANT:	----
PROJECT:	2X800 MW LARA STPP STAGE-II

JOB NO. 508
STATUS CONTRACT
DISTRIBUTION

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

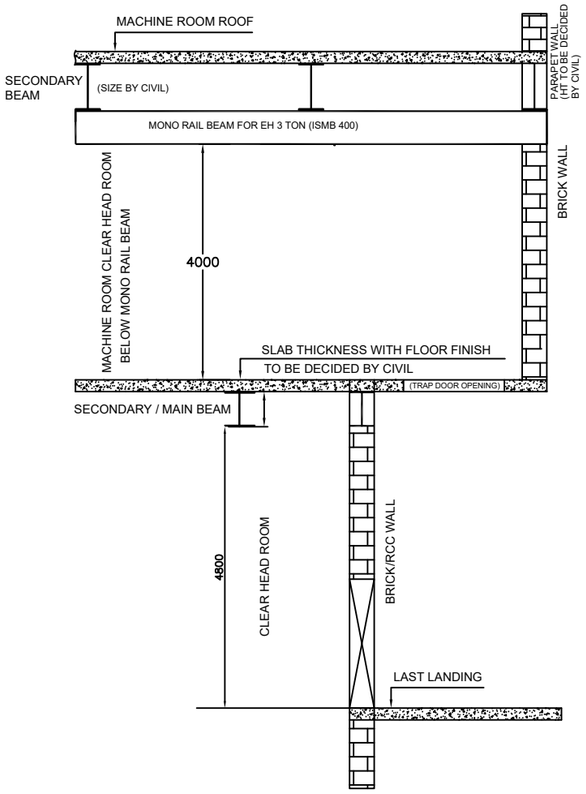
REV.	DATE	ALTD	CHD	APPD

DEPT CODE		NAME	SIGN	DATE
	DRN.			
	DESN	SA		21.12.23
	CHD	VVH		21.12.23
	APPD	KR		21.12.23

TITLE ENGG. INPUTS DRAWING FOR 13 PASS.(884KG) ELEVATOR-TG BUILDING- UNIT#1

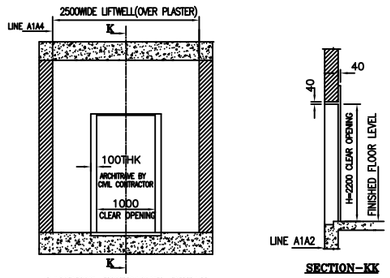
DEPT. | SCALE | SIGN | DRAWING NO. PE-DG-508-502-A001
SHEET 01 OF 01 | REV. 00
SIZE–A0

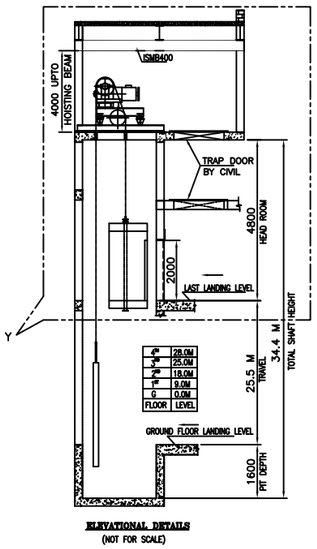
ELEVATION ON MACHINE ROOM



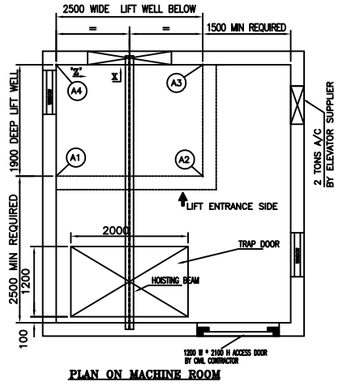
DETAIL–Y

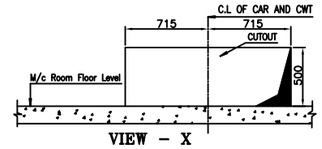
STANDARD DETAILS OF SHAFT

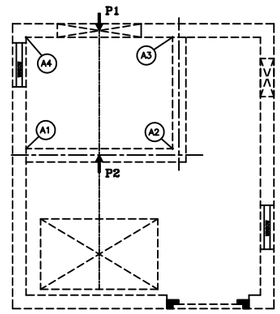




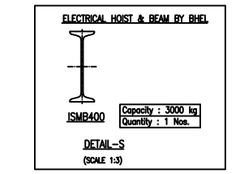
STANDARD DETAILS OF MACHINE ROOM

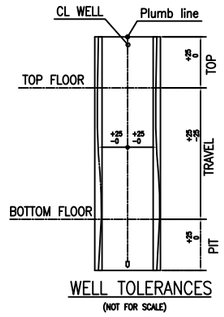






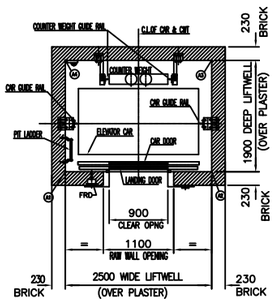
Point	Dynamic Load (Kg)
P1	16000
P2	8000





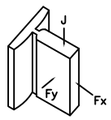
S.NO	AREA	SCOPE	DESCRIPTION OF WORK	AGENCY
1	PIT	CIVIL	PIT LADDER AND SCAFFOLDING IN ELEVATOR SHAFT.	BY VENDOR
2	PIT	CIVIL	PIT SHALL BE MADE DRY AND WATER PROOF.	BY CIVIL CONTRACTOR
3	PIT	CIVIL	BARE PIT SHALL BE PROVIDED. SUPPORTING MS STRUCTURE FOR CAR & CW BUFFER SHALL BE PROVIDED BY VENDOR.	BY VENDOR
4	PIT	CIVIL	PIT SLAB SHALL BE CASTED TO TAKE CARE OF CAR & COUNTERWEIGHT BUFFER LOADS (MAX. LOAD OF 21T) AS THE POSITION OF LOAD & STRUCTURED BUFFER IS VENDOR SPECIFIC . HENCE, CIVIL CONTRACTOR SHALL SIZE THE SLAB THICKNESS ACCORDINGLY WRT TOTAL LOAD OF 21T.	BY CIVIL CONTRACTOR
5	ELEVATOR CAR	ELECTRICAL	ELEVATOR CAR LIGHTING	BY VENDOR
6	ELEVATOR CAR	MECHANICAL	1/2 Kg CO / SUITABLE TYPE FIRE EXTINGUISHER ALONG WITH FIXING ARRANGEMENT.	BY VENDOR
7	AT EVERY LANDING	CIVIL	POCKET CUTTING / HOLES FOR LOP, FRD, LANDING DISPLAY & ANY OTHER FOR EVERY LANDING LEVEL SHALL BE DONE BY VENDOR.	BY VENDOR
8	AT EVERY LANDING	CIVIL	GROUTING FOR LOP, FRD, LANDING DISPLAY & ANY OTHER FOR FIXATION AT EVERY LANDING LEVEL SHALL BE DONE BY VENDOR.	BY VENDOR
9	ELEVATOR SHAFT	CIVIL	SHAFT WHITE WASHING.	BY CIVIL CONTRACTOR
10	ELEVATOR SHAFT	CIVIL	ALL ANCHOR BOLTS FOR FIXING GUIDE BRACKET AND BEAMS IN MACHINE ROOM.	BY VENDOR
11	ELEVATOR SHAFT	CIVIL	LIFT SHAFT HAS TO BE IN THE PLUMB LINE WITH A LIMIT OF -0 +25MM.	BY CIVIL CONTRACTOR
12	ELEVATOR SHAFT	ELECTRICAL	BULK HEAD FITTINGS OF MINIMUM 60 WATTS/ 18W CFL SHALL BE PROVIDED AT EVERY 3 METERS AND A PLUG POINT 15A/5A, 3 PIN AT EVERY 6 METERS-ADJACENT TO THE BULK HEAD FITTINGS. THE POSITION SHOULD BE AT ANY CORNER OF THE WALL OF COUNTER WEIGHT.	BY VENDOR
13	ELEVATOR SHAFT	ELECTRICAL	FIREMAN SWITCH & PIT SWITCHES.	BY VENDOR
14	ELEVATOR SHAFT	MECHANICAL	WIRE MESH BETWEEN CAR & COUNTER WEIGHT.	BY VENDOR
15	MACHINE ROOM	CIVIL	ELEVATOR MACHINE ROOM SHALL BE DESIGNED AS PER THE LOAD REQUIREMENTS GIVEN IN THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
16	MACHINE ROOM	CIVIL	PROVIDE THE REQUIRED HOLES/ POCKETS FOR MAIN ROPES / OSG ROPES/ SHAFT ELECTRIFICATION IN THE MACHINE ROOM FLOOR AS PER THE DIMENSIONS GIVEN IN THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
17	MACHINE ROOM	CIVIL	THE MONORAIL BEAM (3 TONS) FOR HOISTING THE MACHINE & HOIST TO BE PROVIDED AS PER THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR (SUPPLY & ERECTION OF MONORAIL BEAM SHALL BE DONE BY CIVIL CONTRACTOR)
18	MACHINE ROOM	CIVIL	TRAP DOOR SHALL BE PROVIDED AS PER ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
19	MACHINE ROOM	CIVIL	SECONDARY BEAM ARRANGEMENT SHALL BE PERPENDICULAR TO MONORAIL BEAM.	BY CIVIL CONTRACTOR
20	MACHINE ROOM	CIVIL	STANDARD MACHINE ROOM DIMENSIONS AS REQUIRED ARE INDICATED IN THE DRAWING. TO SUIT CIVIL DESIGN WRT CIVIL STRUCTURE STABILITY, MACHINE ROOM SIZE CAN BE INCREASED (AS PER CIVIL REQUIREMENT) AND THEN SIZE OF MONORAIL BEAM(ISMB 400) AS MENTIONED IN DETAIL-Y VIEW SHALL BE FINALIZED BY CIVIL AGENCY.	BY CIVIL CONTRACTOR
21	MACHINE ROOM	CIVIL	PROPER ACCESS TO THE MACHINE ROOM SHALL BE PROVIDED AND IT SHOULD BE SAFE AND RIGID WITH HANDRAILS FOR ADEQUATE GRIP.	BY CIVIL CONTRACTOR
22	MACHINE ROOM	ELECTRICAL	THE MACHINE ROOM SHALL BE ADEQUATELY ILLUMINATED. THE MACHINE ROOM SHALL HAVE MINIMUM 200 LUX ILLUMINATION AT THE FLOOR LEVEL.	BY VENDOR
23	MACHINE ROOM	ELECTRICAL	CONVENIENT OUTLET (15A /5A) IN THE MACHINE ROOM TO BE PROVIDED FOR POWER TOOL USAGE.	BY VENDOR
24	MACHINE ROOM	ELECTRICAL	ONLY TWO (3 PHASE) SUPPLY FEEDERS PER ELEVATOR SHALL BE PROVIDED ONE FEEDER SHALL BE DEDICATED TO ELEVATOR MOTOR AND OTHER 3 PHASE SUPPLY FEEDER SHALL BE PROVIDED BY BHEL FOR AIR CONDITIONER, MACHINE ROOM AND SHAFT LIGHTING AND MAINTENANCE /INSTALLATION REQUIREMENT. VENDOR SHALL PROVIDE CT FOR STEPPING DOWN THE VOLTAGE AS PER THEIR REQUIREMENT.	BY ELECTRICAL CONTRACTOR **(VENDOR TO CONSIDER CT IN THEIR SCOPE FOR STEPPING DOWN THE VOLTAGE AS PER THEIR REQUIREMENT)**
25	MACHINE ROOM	ELECTRICAL	THE TERMINATION & TERMINATION BOX FOR THE FEEDERS SHALL BE PROVIDED.	BY VENDOR
26	MACHINE ROOM	ELECTRICAL	THE EARTHING LEADS / EARTH STRIPS SHALL BE PROVIDED NEAR ELEVATOR SHAFT AT GROUND FLOOR BY ELECTRICAL CONTRACTOR AND FROM GROUND FLOOR TO MACHINE ROOM SHALL BE ROUTED BY VENDOR.	BY ELECTRICAL CONTRACTOR & BY VENDOR
27	MACHINE ROOM	ELECTRICAL	EPABX CONNECTIVITY SHALL BE PROVIDED TILL MACHINE ROOM BY ELECTRICAL CONTRACTOR & FROM MACHINE ROOM TO ELEVATOR BY VENDOR	**BY ELECTRICAL CONTRACTOR & BY VENDOR**
28	MACHINE ROOM	MECHANICAL	SPLIT AC (MIN 2 TONS) TO BE PROVIDED IN THE EACH ELEVATOR MACHINE ROOM.	BY VENDOR
29	ELEVATOR SHAFT	CIVIL	ELEVATOR SHAFT SHALL BE OF CLAY BRICK (MIN. 230MM THK) OR R.C.C ONLY. (FLY ASH BRICKS NOT TO BE USED). LINTEL BEAM AT EVERY 2.3 M TO 2.5 M SHALL BE PROVIDED FOR COUNTER WEIGHT & CAR BRACKET FIXING.	BY CIVIL CONTRACTOR
30	ELEVATOR SHAFT	CIVIL	LIFT ENTRANCE SIDE WALL (ON ALL FLOORS) SHALL BE KEPT ON HOLD & SHALL BE CONSTRUCTED AFTER ORDERING/ RECEIVING INPUT FROM FINALLY SELECTED BIDDER. UPON LIFTING HOLD, FINAL WALL CONSTRUCTION SHALL BE DONE BY CIVIL CONTRACTOR ONLY.	BY CIVIL CONTRACTOR
31	ELEVATOR SHAFT	CIVIL	CLEAR HEADROOM OF 4.8M IS REQUIRED ABOVE LAST LANDING LEVEL OF ELEVATOR (EXCLUDING MACHINE ROOM SLAB THICKNESS & SECONDARY BEAM (IF ANY)). THE SAME IS TO BE ENSURED ACCORDINGLY BY CIVIL CONTRACTOR.	BY CIVIL CONTRACTOR
32	ELEVATOR SHAFT	CIVIL	IN CASE OF DUPLEX ARRANGEMENT OF ELEVATORS, WHERE ELEVATORS ARE PLACED SIDE BY SIDE, BRACKET OF GUIDE RAILS FOR BOTH THE ELEVATORS SHALL BE FIXED ON THE COMMON WALL BETWEEN BOTH LIFT SHAFTS. HENCE, THIS WALL MAY BE SUITABLY DESIGNED/ STRENGTHENED SO AS TO SUSTAIN REQUIRED GUIDE RAIL LOADS AS THIS WALL SHALL BE SUBJECT TO GUIDE RAIL FORCES FROM BOTH SIDES.	BY CIVIL CONTRACTOR
33	ELEVATOR SHAFT	CIVIL	DUMMY LANDING/S, ARE REQUIRED IN CASE TRAVEL BETWEEN TWO CONSECUTIVE LANDINGS IS MORE THAN 10 M, AS PER CODAL REQUIREMENT. HENCE, CORRESPONDING LANDING PLATFORMS & SUITABLE ACCESS LADDER/ STAIRS FOR DUMMY LANDING PLATFORMS ARE ALSO TO BE PROVIDE ACCORDINGLY.	BY CIVIL CONTRACTOR
34	ELEVATOR SHAFT	CIVIL	CIVIL LOADS SHALL BE TRANSFERRED TO WALLS (TYPICAL LOCATION AS SHOWN IN DRAWING). WALLS SHALL BE DESIGNED ACCORDINGLY.	BY CIVIL CONTRACTOR
35	MACHINE ROOM	CIVIL	CLEAR HEIGHT OF 4M IS REQUIRED IN THE ELEVATOR MACHINE ROOM BELOW MONORAIL BEAM (I.E. EXCLUDING MONORAIL BEAM (FOR ELECTRIC HOIST), SECONDARY BEAMS (IF ANY) & SLAB THICKNESS). HENCE, ELEVATION OF TOP OF MACHINE ROOM ROOF TO BE CALCULATED ACCORDINGLY BY CIVIL CONTRACTOR.	BY CIVIL CONTRACTOR
36	MACHINE ROOM	CIVIL	TRAP DOOR IS TO BE PLACED IN MACHINE ROOM TOWARDS ELEVATOR LANDING SIDE CONSIDERING THAT NO EQUIPMENTS/ OBJECTS SHALL BE LOCATED BELOW THE SAME AT LAST LANDING LEVEL FLOOR, ELSE IT WOULD CAUSE HINDRANCE IN MOVEMENT OF ELEVATOR MACHINERY OUT OF THE MACHINE ROOM DURING MAINTAINENCE.	BY CIVIL CONTRACTOR
37	PIT, SHAFT & MACHINE ROOM	CIVIL	NO PROJECTIONS ARE ALLOWED INSIDE THE LIFT SHAFT / PIT AND MACHINE ROOM. HENCE PLEASE ENSURE THAT ANY COLUMN / COLUMN FOUNDATIONS/ PLINTH BEAMS/ FLOOR SUPPORTING BEAMS SHOULD NOT BE PROJECTED INSIDE THE LIFT SHAFT/ PIT & ELEVATOR MACHINE ROOM.	BY CIVIL CONTRACTOR
38	MACHINE ROOM	CIVIL	MINIMUM REQUIREMENT OF MACHINE ROOM ALONG WITH TRAP DOOR ARE INDICATED HERE. HOWEVER PROJECT SPECIFIC REQUIREMENTS SHALL BE DISCUSSED ON CASE TO CASE BASIS.	BY CIVIL CONTRACTOR

NOTE: ALL DIMENSIONS ARE IN MM



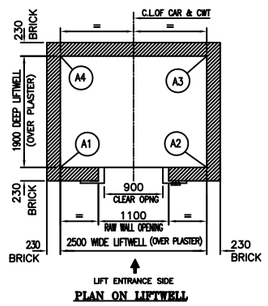
FORCES ON CAR & CWT GUIDE RAIL	
Fx	1300 N
Fy	600 N
J	23000 N

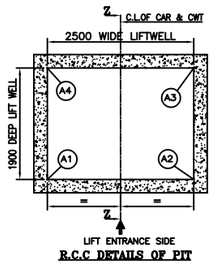
GUIDE RAIL FORCES

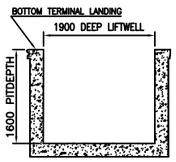


PLAN ON LIFTWELL– TYPICAL LOCATION OF GUIDERAILS FOR CAR & COUNTERWEIGHT

STANDARD DETAILS OF PIT







CUSTOMER	NTPC
CONSULTANT	----
PROJECT	2X800 MW LARA STPP STAGE-II

JOB NO. 508
STATUS CONTRACT
DISTRIBUTION

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

REV.	DATE	ALTD	CHD	APPD

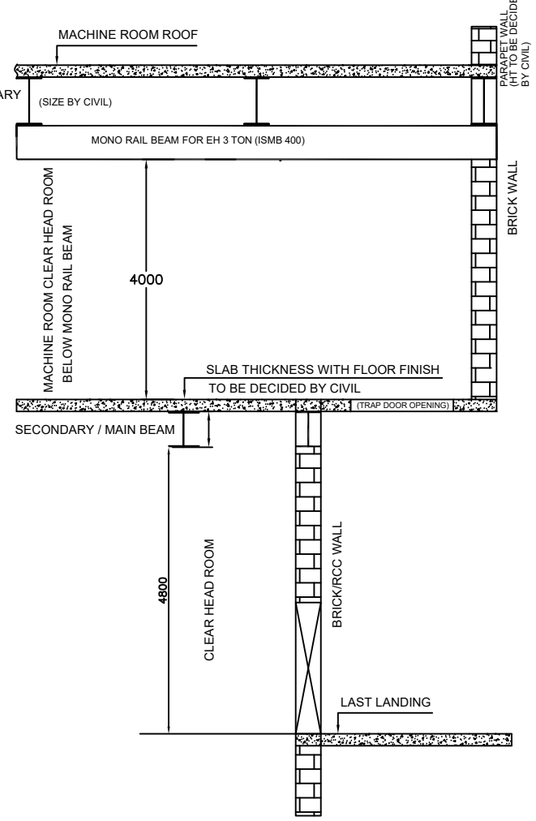
DEPT CODE		NAME	SIGN	DATE
	DRN.			
	DESN	SA		21.12.23
	CHD	VVH		21.12.23
	APPD	KR		21.12.23

TITLE ENGG. INPUTS DRAWING FOR 13 PASS.(884KG) ELEVATOR-TG BUILDING-UNIT #2

DEPT.	SCALE	DRAWING NO.	
SIGN		PE-DG-508-502-A002	
		SHEET 01 OF 01	REV. 00

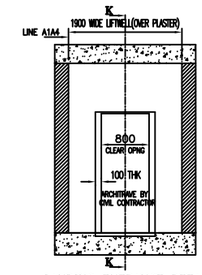
SIZE–A0

ELEVATION ON MACHINE ROOM

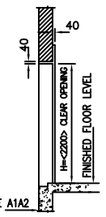


DETAIL–Y

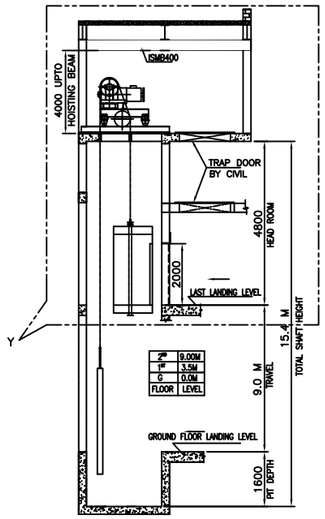
STANDARD DETAILS OF SHAFT



LANDING ENTRANCE DETAIL
(VIEW FROM LIFT WELL OUTSIDE)
(TYPICAL FOR ALL FLOORS)

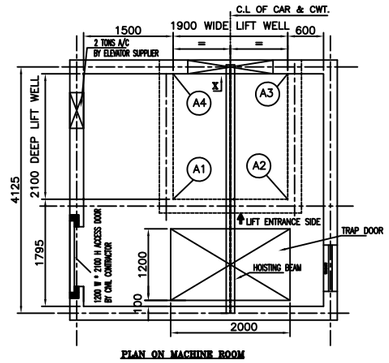


SECTION–KK

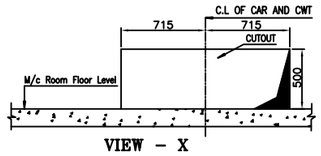


ELEVATIONAL DETAILS
(NOT FOR SCALE)

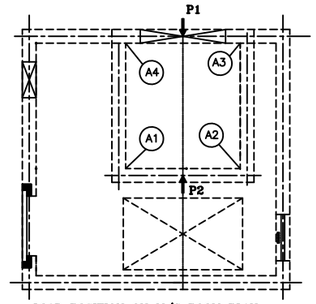
STANDARD DETAILS OF MACHINE ROOM



PLAN ON MACHINE ROOM

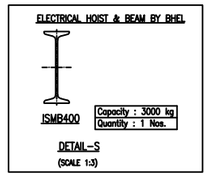


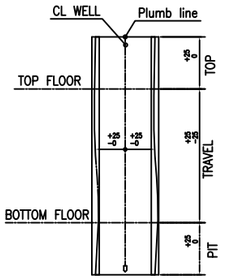
VIEW – X



LOAD POSITION ON M/C ROOM PLAN

Point	Dynamic Load (Kg)
P1	15000
P2	6000

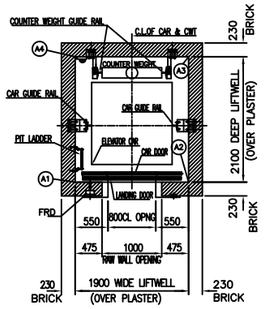




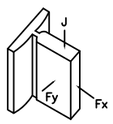
WELL TOLERANCES
(NOT FOR SCALE)

S.NO	AREA	SCOPE	DESCRIPTION OF WORK	AGENCY
1	PIT	CIVIL	PIT LADDER AND SCAFFOLDING IN ELEVATOR SHAFT.	BY VENDOR
2	PIT	CIVIL	PIT SHALL BE MADE DRY AND WATER PROOF.	BY CIVIL CONTRACTOR
3	PIT	CIVIL	BARE PIT SHALL BE PROVIDED. SUPPORTING MS STRUCTURE FOR CAR & CW BUFFER SHALL BE PROVIDED BY VENDOR.	BY VENDOR
4	PIT	CIVIL	PIT SLAB SHALL BE CASTED TO TAKE CARE OF CAR & COUNTERWEIGHT BUFFER LOADS (MAX. LOAD OF 21T) AS THE POSITION OF LOAD & STRUCTURED BUFFER IS VENDOR SPECIFIC . HENCE, CIVIL CONTRACTOR SHALL SIZE THE SLAB THICKNESS ACCORDINGLY WRT TOTAL LOAD OF 21T.	BY CIVIL CONTRACTOR
5	ELEVATOR CAR	ELECTRICAL	ELEVATOR CAR LIGHTING	BY VENDOR
6	ELEVATOR CAR	MECHANICAL	1/2 Kg CO / SUITABLE TYPE FIRE EXTINGUISHER ALONG WITH FIXING ARRANGEMENT.	BY VENDOR
7	AT EVERY LANDING	CIVIL	POCKET CUTTING / HOLES FOR LOP, FRD, LANDING DISPLAY & ANY OTHER FOR EVERY LANDING LEVEL SHALL BE DONE BY VENDOR.	BY VENDOR
8	AT EVERY LANDING	CIVIL	GROUTING FOR LOP, FRD, LANDING DISPLAY & ANY OTHER FOR FIXATION AT EVERY LANDING LEVEL SHALL BE DONE BY VENDOR.	BY VENDOR
9	ELEVATOR SHAFT	CIVIL	SHAFT WHITE WASHING.	BY CIVIL CONTRACTOR
10	ELEVATOR SHAFT	CIVIL	ALL ANCHOR BOLTS FOR FIXING GUIDE BRACKET AND BEAMS IN MACHINE ROOM.	BY VENDOR
11	ELEVATOR SHAFT	CIVIL	LIFT SHAFT HAS TO BE IN THE PLUMB LINE WITH A LIMIT OF -0 +25MM.	BY CIVIL CONTRACTOR
12	ELEVATOR SHAFT	ELECTRICAL	BULK HEAD FITTINGS OF MINIMUM 60 WATTS/ 18W CFL SHALL BE PROVIDED AT EVERY 3 METERS AND A PLUG POINT 15A/5A, 3 PIN AT EVERY 6 METERS-ADJACENT TO THE BULK HEAD FITTINGS. THE POSITION SHOULD BE AT ANY CORNER OF THE WALL OF COUNTER WEIGHT.	BY VENDOR
13	ELEVATOR SHAFT	ELECTRICAL	FIREMAN SWITCH & PIT SWITCHES.	BY VENDOR
14	ELEVATOR SHAFT	MECHANICAL	WIRE MESH BETWEEN CAR & COUNTER WEIGHT.	BY VENDOR
15	MACHINE ROOM	CIVIL	ELEVATOR MACHINE ROOM SHALL BE DESIGNED AS PER THE LOAD REQUIREMENTS GIVEN IN THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
16	MACHINE ROOM	CIVIL	PROVIDE THE REQUIRED HOLES/ POCKETS FOR MAIN ROPES / OSG ROPES/ SHAFT ELECTRIFICATION IN THE MACHINE ROOM FLOOR AS PER THE DIMENSIONS GIVEN IN THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
17	MACHINE ROOM	CIVIL	THE MONORAIL BEAM (3 TONS) FOR HOISTING THE MACHINE & HOIST TO BE PROVIDED AS PER THE ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR (SUPPLY & ERECTION OF MONORAIL BEAM SHALL BE DONE BY CIVIL CONTRACTOR)
18	MACHINE ROOM	CIVIL	TRAP DOOR SHALL BE PROVIDED AS PER ENGG. INPUTS DRAWING FOR ELEVATOR.	BY CIVIL CONTRACTOR
19	MACHINE ROOM	CIVIL	SECONDARY BEAM ARRANGEMENT SHALL BE PERPENDICULAR TO MONORAIL BEAM.	BY CIVIL CONTRACTOR
20	MACHINE ROOM	CIVIL	STANDARD MACHINE ROOM DIMENSIONS AS REQUIRED ARE INDICATED IN THE DRAWING. TO SUIT CIVIL DESIGN WRT CIVIL STRUCTURE STABILITY, MACHINE ROOM SIZE CAN BE INCREASED (AS PER CIVIL REQUIREMENT) AND THEN SIZE OF MONORAIL BEAM(ISMB 400) AS MENTIONED IN DETAIL-Y VIEW SHALL BE FINALIZED BY CIVIL AGENCY.	BY CIVIL CONTRACTOR
21	MACHINE ROOM	CIVIL	PROPER ACCESS TO THE MACHINE ROOM SHALL BE PROVIDED AND IT SHOULD BE SAFE AND RIGID WITH HANDRAILS FOR ADEQUATE GRIP.	BY CIVIL CONTRACTOR
22	MACHINE ROOM	ELECTRICAL	THE MACHINE ROOM SHALL BE ADEQUATELY ILLUMINATED. THE MACHINE ROOM SHALL HAVE MINIMUM 200 LUX ILLUMINATION AT THE FLOOR LEVEL.	BY VENDOR
23	MACHINE ROOM	ELECTRICAL	CONVENIENT OUTLET (15A /5A) IN THE MACHINE ROOM TO BE PROVIDED FOR POWER TOOL USAGE.	BY VENDOR
24	MACHINE ROOM	ELECTRICAL	ONLY TWO (3 PHASE) SUPPLY FEEDERS PER ELEVATOR SHALL BE PROVIDED ONE FEEDER SHALL BE DEDICATED TO ELEVATOR MOTOR AND OTHER 3 PHASE SUPPLY FEEDER SHALL BE PROVIDED BY BHEL FOR AIR CONDITIONER, MACHINE ROOM AND SHAFT LIGHTING AND MAINTENANCE /INSTALLATION REQUIREMENT. VENDOR SHALL PROVIDE CT FOR STEPPING DOWN THE VOLTAGE AS PER THEIR REQUIREMENT.	BY ELECTRICAL CONTRACTOR (VENDOR TO CONSIDER CT IN THEIR SCOPE FOR STEPPING DOWN THE VOLTAGE AS PER THEIR REQUIREMENT)
25	MACHINE ROOM	ELECTRICAL	THE TERMINATION & TERMINATION BOX FOR THE FEEDERS SHALL BE PROVIDED.	BY VENDOR
26	MACHINE ROOM	ELECTRICAL	THE EARTHING LEADS / EARTH STRIPS SHALL BE PROVIDED NEAR ELEVATOR SHAFT AT GROUND FLOOR BY ELECTRICAL CONTRACTOR AND FROM GROUND FLOOR TO MACHINE ROOM SHALL BE ROUTED BY VENDOR.	BY ELECTRICAL CONTRACTOR & BY VENDOR
27	MACHINE ROOM	ELECTRICAL	EPABX CONNECTIVITY SHALL BE PROVIDED TILL MACHINE ROOM BY ELECTRICAL CONTRACTOR & FROM MACHINE ROOM TO ELEVATOR BY VENDOR	BY ELECTRICAL CONTRACTOR & BY VENDOR
28	MACHINE ROOM	MECHANICAL	SPLIT AC (MIN 2 TONS) TO BE PROVIDED IN THE EACH ELEVATOR MACHINE ROOM.	BY VENDOR
29	ELEVATOR SHAFT	CIVIL	ELEVATOR SHAFT SHALL BE OF CLAY BRICK (MIN. 230MM THK) OR R.C.C ONLY. (FLY ASH BRICKS NOT TO BE USED). LINTEL BEAM AT EVERY 2.3 M TO 2.5 M SHALL BE PROVIDED FOR COUNTER WEIGHT & CAR BRACKET FIXING.	BY CIVIL CONTRACTOR
30	ELEVATOR SHAFT	CIVIL	LIFT ENTRANCE SIDE WALL (ON ALL FLOORS) SHALL BE KEPT ON HOLD & SHALL BE CONSTRUCTED AFTER ORDERING/ RECEIVING INPUT FROM FINALLY SELECTED BIDDER. UPON LIFTING HOLD, FINAL WALL CONSTRUCTION SHALL BE DONE BY CIVIL CONTRACTOR ONLY.	BY CIVIL CONTRACTOR
31	ELEVATOR SHAFT	CIVIL	CLEAR HEADROOM OF 4.8M IS REQUIRED ABOVE LAST LANDING LEVEL OF ELEVATOR (EXCLUDING MACHINE ROOM SLAB THICKNESS & SECONDARY BEAM (IF ANY)). THE SAME IS TO BE ENSURED ACCORDINGLY BY CIVIL CONTRACTOR.	BY CIVIL CONTRACTOR
32	ELEVATOR SHAFT	CIVIL	IN CASE OF DUPLEX ARRANGEMENT OF ELEVATORS, WHERE ELEVATORS ARE PLACED SIDE BY SIDE, BRACKET OF GUIDE RAILS FOR BOTH THE ELEVATORS SHALL BE FIXED ON THE COMMON WALL BETWEEN BOTH LIFT SHAFTS. HENCE, THIS WALL MAY BE SUITABLY DESIGNED/ STRENGTHENED SO AS TO SUSTAIN REQUIRED GUIDE RAIL LOADS AS THIS WALL SHALL BE SUBJECT TO GUIDE RAIL FORCES FROM BOTH SIDES.	BY CIVIL CONTRACTOR
33	ELEVATOR SHAFT	CIVIL	DUMMY LANDING/S, ARE REQUIRED IN CASE TRAVEL BETWEEN TWO CONSECUTIVE LANDINGS IS MORE THAN 10 M, AS PER CODAL REQUIREMENT. HENCE, CORRESPONDING LANDING PLATFORMS & SUITABLE ACCESS LADDER/ STAIRS FOR DUMMY LANDING PLATFORMS ARE ALSO TO BE PROVIDE ACCORDINGLY.	BY CIVIL CONTRACTOR
34	ELEVATOR SHAFT	CIVIL	CIVIL LOADS SHALL BE TRANSFERRED TO WALLS (TYPICAL LOCATION AS SHOWN IN DRAWING). WALLS SHALL BE DESIGNED ACCORDINGLY.	BY CIVIL CONTRACTOR
35	MACHINE ROOM	CIVIL	CLEAR HEIGHT OF 4M IS REQUIRED IN THE ELEVATOR MACHINE ROOM BELOW MONORAIL BEAM (I.E. EXCLUDING MONORAIL BEAM (FOR ELECTRIC HOIST), SECONDARY BEAMS (IF ANY) & SLAB THICKNESS). HENCE, ELEVATION OF TOP OF MACHINE ROOM ROOF TO BE CALCULATED ACCORDINGLY BY CIVIL CONTRACTOR.	BY CIVIL CONTRACTOR
36	MACHINE ROOM	CIVIL	TRAP DOOR IS TO BE PLACED IN MACHINE ROOM TOWARDS ELEVATOR LANDING SIDE CONSIDERING THAT NO EQUIPMENTS/ OBJECTS SHALL BE LOCATED BELOW THE SAME AT LAST LANDING LEVEL FLOOR, ELSE IT WOULD CAUSE HINDRANCE IN MOVEMENT OF ELEVATOR MACHINERY OUT OF THE MACHINE ROOM DURING MAINTAINENCE.	BY CIVIL CONTRACTOR
37	PIT, SHAFT & MACHINE ROOM	CIVIL	NO PROJECTIONS ARE ALLOWED INSIDE THE LIFT SHAFT / PIT AND MACHINE ROOM. HENCE PLEASE ENSURE THAT ANY COLUMN / COLUMN FOUNDATIONS/ PLINTH BEAMS/ FLOOR SUPPORTING BEAMS SHOULD NOT BE PROJECTED INSIDE THE LIFT SHAFT/ PIT & ELEVATOR MACHINE ROOM.	BY CIVIL CONTRACTOR
38	MACHINE ROOM	CIVIL	MINIMUM REQUIREMENT OF MACHINE ROOM ALONG WITH TRAP DOOR ARE INDICATED HERE. HOWEVER PROJECT SPECIFIC REQUIREMENTS SHALL BE DISCUSSED ON CASE TO CASE BASIS.	BY CIVIL CONTRACTOR

NOTE: ALL DIMENSIONS ARE IN MM



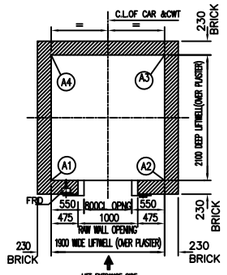
FORCES ON CAR & CWT GUIDE RAIL	
Fx	700 N
Fy	600 N
J	19000 N



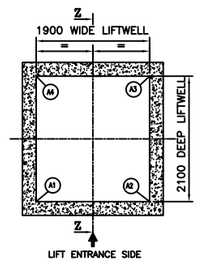
GUIDE RAIL FORCES

PLAN ON LIFTWELL– TYPICAL LOCATION OF GUIDERAILS FOR CAR & COUNTERWEIGHT

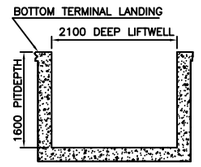
STANDARD DETAILS OF PIT



PLAN ON LIFTWELL



R.C.C DETAILS OF PIT



SECTION ZZ

CUSTOMER:	NTPC		
CONSULTANT:	----		
PROJECT:	2X800 MW LARA STPP STAGE-II		
JOB NO. 508	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA		
STATUS CONTRACT			
DISTRIBUTION			

REV.	DATE	ALTD	CHD	APPD

DEPT CODE	DRN.	NAME	SIGN	DATE
	DESN	SA		21.12.23
	CHD	VVH		21.12.23
	APPD	RR		21.12.23

TITLE ENGG. INPUTS DRAWING FOR 10 PASS. (680KG) ELEVATOR-ESP BUILDING

DEPT.	SCALE
SIGN	

DRAWING NO. PE-DG-508-502-A003
SHEET 01 OF 01 REV. 00
SIZE–A0