INDEX-BID DOCUMENTS-DISTRIBUTION BOARD for PARICCHA ESP R&M Project

309504/2024/PS-PEM-EL

बी एच ई एल BHEL	**2x210 MW PARICHHA TPS STAGE-II** **ESP (R&M)** **PRE-QUALIFICATION REQUIREMENTS FOR DISTRIBUTION BOARDS**	PE-PQ-503-558-E005 REVISION NO. 00 DATE 17/05/2024 SHEET NO. 1 OF 2

ITEMS: LDBs/ WDBs/ Lighting Panels

SCOPE : Supply : YES; Erection & Commissioning : NO

1	Vendor should be designer & manufacturer of LDBs/ WDBs.
2 (a)	Availability of temperature rise and degree of protection test certificates conducted at independent lab or witnessed by third party for LDBs/ WDBs.
2 (b)	Availability of test reports (witnessed by third party) to establish in-house capability to carry out all Functional tests, HV test, IR measurement as per relevant IS for LDBs/ WDBs.
3	One (1) no. performance certificates for min. two (2) years of trouble-free operation for LDB/ WDB and lighting panel. Performance certificate should be from end user only. Performance certificates should not be more than ten (10) years old from the date of techno- commercial bid opening. OR Two no. purchase orders received from One (1) purchaser/end user for LDB/WDB and lighting panel during last 10 years provided the gap between awards of two PO's is minimum 2 years.
4	Capacity of manufacturing 3 nos. LDBs/ WDBs, 10 nos. Lighting Panels per month.
5	Manufactured and supplied at least 10 nos. LDBs/ WDB's, 30 nos. Lighting Panels in one or more orders.
6	(Minimum 2 nos. purchase orders for the LDBs/WDBs) OR (1 no. purchase order for the LDBs/WDBs & 1 no. purchase order for the lighting panel) shall be submitted which should not be more than five (5) years old from the date of techno- commercial bid opening for establishing continuity in business.

Notes:-

1. The credentials for LDB/ WDB's should pertain to min. 100A rating and for LP's to min 63A incomer rating.
2. In place of LDBs/ WDBs, documents submitted for LT switchgear panels shall also be considered.
3. In place of Lighting Panels, documents submitted for wall mounted electrical JB's & feeder pillars etc. (with min. rating 63A) shall also be considered.
4. Consideration of offer shall be subject to customer's approval of bidders, if applicable.
5. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
17/05/2024	17.05.24	17/5/2024	17/5/2024
ANSHIKA DALAL (ENGINEER)	KHUSHBU AGRAWAL /NN JAJWARE (SR.MANAGER)	PRAVEEN DUTTA AGM	DEBASISA RATH (GM, DH-ELECTRICAL)

	2x210 MW PARICHHA TPS STAGE-II ESP (R&M) PRE-QUALIFICATION REQUIREMENTS FOR DISTRIBUTION BOARDS	PE-PQ-503-558-E005 REVISION NO. 00 DATE 17/05/2024 SHEET NO. 1 OF 2

6. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.

7. After satisfactory fulfillment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
17/05/2024 ANSHIKA DALAL (ENGINEER)	17.05.24 KHUSHBU AGRAWAL /NN JAJWARE (SR.MANAGER)	17/5/24 PRAVEEN DUTTA AGM	17/5/2024 DEBASISA RATH (GM, DH-ELECTRICAL)

2 X 210 MW PARICHHA ESP R&M					
BOQ & UNPRICED SCHEDULE FOR DISTRIBUTION BOARDS					
Item No.	**DESCRIPTION** **MAIN SUPPLY ITEMS**	**UNIT**	**QTY.**	**UNIT EX-WORKS PRICE**	**TOTAL PRICE**
1.0	**Lighting Distribution Board (LDB)**				
1.1	AC LDB Type LDB-H (12) without transformer (including cubicle suitable for 2 nos. 100 kVA transformer)	Nos.	2		
1.1.1	100kVA transformer for housing in 1.1 - Normal Non encapsulated type	Nos.	4		
1.2	AC Emergency LDB Type LDB-F (8) without transformer (including cubicle suitable for 2 nos. 50 kVA transformer)	Nos.	2		
1.2.1	50kVA transformer for housing in 1.2 - Normal Non encapsulated type	Nos.	4		
1.3	AC WDB Type WDB-H (12)	Nos.	2		
1.3.1	100kVA transformer for housing in AC WDB	Nos.	2		
1.4	DCLDB Type LDB-D (6)	Nos.	2		
2.0	**Lighting Panels (LP)**				
2.1	LP-12 (Outdoor) with Timer	Nos.	6		
2.2	LP- 12 (Indoor) (Decorative) with Timer	Nos.	2		
2.3	Normal NLP- 6 (Indoor)	Nos.	2		
2.4	Emergency ELP- 6 (Indoor)	Nos.	2		
2.5	LP- 6 (Outdoor) with Timer	Nos.	6		
2.6	DCLP-6 (Outdoor) with Timer	Nos.	2		
2.7	DCLP-6 (indoor)	Nos.	2		

2 X 210 MW PARICHHA ESP R&M					
BOQ & UNPRICED SCHEDULE FOR MANDATORY SPARES					
Item No.	**DESCRIPTION** **MANDATORY SPARES ITEMS**	**UNIT**	**QTY.**	**UNIT EX-WORKS**	**TOTAL PRICE**
1	Lighting Panels - Timer 24 hrs	Nos.	1		

2x210 MW PARICHHA THERMAL POWER STATION
STAGE-II ESP (R&M)

VOLUME – II

TECHNICAL SPECIFICATION FOR

DISTRIBUTION BOARDS

SPECIFICATION NO: PE-TS-503-558-E002, REV-0

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UTTAR PRADESH, INDIA – 201301

309504/2024/PS-PEM-EL

	TECHNICAL SPECIFICATION FOR DISTRIBUTION BOARDS	SPECIFICATION NO. PE-TS-503-558-E002	
		VOLUME II	
		CONTENTS SHEET	
	2x210 MW PARICHHA TPS STAGE-II ESP (R&M)	REV. 0	DATE: 14.05.2024
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TOTAL NUMBER OF SHEETS (INCLUDING COVER & SEPARATOR SHEETS): 63

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	2x210 MW PARICHHA TPS STAGE-II ESP (R&M)	REV. 0 / DATE: 14.05.2024
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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.

2. There are no deviations with respect to specification.

3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.

4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.

5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in BOQ-Cum-Price schedule of the specification shall not be considered (i.e. technical description & quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE

	TECHNICAL SPECIFICATION FOR DISTRIBUTION BOARDS	SPECIFICATION NO. PE-TS-503-558-E002	
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1.0 SCOPE OF SUPPLY

1.1 Design, manufacture, assembly, inspection & testing at vendor's/ sub-vendor's works, proper packing and delivery to site of LIGHTING DB/ WELDING DB & LIGHTING PANELS as mentioned in different sections of this specification, complete with all accessories for efficient and trouble-free operation.

1.2 Standard technical requirements of LIGHTING DBs/ WELDING DBs & LIGHTING PANELS are indicated in Section-II. Project specific requirements/changes are listed in Section-I.

1.3 The stipulations of Section-I, followed by those of Data Sheet-A shall prevail and govern in case of conflict between the corresponding requirements of Section-I and Section-II.

1.4 Review of sub-vendor's documents by the vendor shall not relieve the vendor from the responsibility of design & supply as per contract / relevant standards.

1.5 The documents shall be in English language and MKS system of units.

1.6 Make of all equipment and components shall be as per attached Sub-Vendor List enclosed as per Annexure-1 to section- I.

2.0 BILL OF QUANTITIES:

2.1 Quantity requirements shall be as per BOQ-cum-price schedule as part of NIT.

2.2 Supplier to also give the following undertaking in the BOM: "The BoM provided herewith completes the scope (in content and intent) of material supply under PO No. ----------, dated ------. Any additional material which may become necessary for the intended application of the supplied item(s)/package will be supplied free of cost in most reasonable time."

3.0 SPECIFIC TECHNICAL REQUIREMENTS

S.no	Reference clause no of section-II (if any)	Specific requirement / change
1	Clause 3.1.1	Following clause is added: Interlock required to be provided between two incomer & bus coupler of LDB.
2	Clause 10.2	Clause 10.2 shall be read as: Erection & commissioning spares are included in the bidder's scope of supply. Bidder to furnish list of E&C spares(if applicable).
3	Clause no 3.2.1 : General requirements of	With ref. to the requirement furnished in clause 3.2.1 of Section II, Bidder to consider the following:

	lighting panel	1. All LP shall be provided with provision of manual override. 2. Bus bars of DBs shall be sized to carry continuously the total running load of the system plus a 20% margin. 3. (a) Lighting panels shall be constructed out of 2 mm thick CRCA sheet steel. The door shall be hinged and the panel shall be gasketted to achieve specified degree of protection. Lighting panels shall be powder coated with color shade RAL9002. Lighting panels shall have min. IP55 degree of protection. (b) All MCBs/isolators/Switches/Contactors etc. shall be mounted inside the panel and a fibre glass sheet shall be provided inside the main door such that the operating knobs of MCBs etc., shall project out of it for safe operation against accidental contact. (c) Terminal blocks shall be 1100 V grade, clip-on stud type, made up of polyamide 6.6 or better suitable for terminating multicore 35 or 70 Sq. mm. stranded aluminium conductor incoming cable and 10 Sq. mm. stranded aluminium conductor for each outgoing circuits voltage. All terminals shall be shrouded, numbered and provided with identification strip for the feeders. (d) MCB's shall be current limiting type with magnetic and thermal release suitable for manual closing and automatic tripping under fault condition. MCB's shall have short circuit interrupting capacity of 10 KA rms. MCB knob shall be marked with ON/OFF indication. A trip free release shall be provided to ensure tripping on fault even if the knob is held in ON position. MCB terminal shall be shrouded to avoid accidental contact. (e) DC switches shall be rotary type, 2 pole, continuous duty, load break type, quick make quick break, suitable for 220 V DC, 2 wire system. Switch knob shall be provided with ON/OFF indication. (f) Programmable Digital Timer shall be Electronic Astronomical Almanac Time switch with battery back-up of min. TEN years, 4 Digit LED display, 24 hours range, manual override facility, 10 Amp 3 relay output, with NO/NC Contacts suitable for operation on 240V single phase AC supply.
4	Clause 8.1	Clause 8.1 shall be read as :

		Standard Quality Plan is enclosed. Inspection shall be carried out as per Quality Plan (0000-999-QOE-S-034) without any implication on cost and delivery. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. There shall be no commercial implication to BHEL on account of any changes in QP during contract stage.
5	Clause 8.0	In addition to Clause 8.0, bidder to consider the following: All equipment to be supplied shall be of type tested design. During detail engineering, the contractor shall submit for Owner's approval the reports of all the type tests as listed in this specification and carried out within last ten years from date of bid opening: 16.09.2022. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. However, if the contractor is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the contractor shall conduct all such tests under this contract at no additional cost to the owner either at third party lab or in presence of client/owners representative and submit the reports for approval. 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. Selection of samples for type test, acceptance test & routine test and acceptance criteria for all the items shall be as per relevant IS.

4.0 DOCUMENTATION

4.1 Documents required along with the technical offer: -
a) Signed & Stamped copy of Compliance certificate.
b) Signed & stamped copy of unpriced price schedule with "quoted" word indicated against all items.
c) List of E&C Spares (If applicable).
d) All PQR related documents.

4.2 Documents required after award of LOI/PO shall be as below (to be submitted by successful bidder) :

Sl. No.	*BHEL Drawing No.*	*Drawing Title*	*Vendor Sub (Days)**	*BHEL comment (Days)*	*Vendor Sub (Days)#*	*BHEL and Customer comment/ approval (Days)*
Primary Documents						
1	PE-V0-503-558-E902	QUALITY PLAN OF LIGHTING DISTRIBUTION BOARDS	11	8	8	18
2	PE-V0-503-558-E502	DATASHEET, GA & SCHEMATIC DRAWING OF LIGHTING DISTRIBUTION BOARDS	11	8	8	18
3	PE-V0-503-558-E504	DATA SHEET, GA & SCHEMATIC DRAWING OF LIGHTING PANEL	11	8	8	18
4	PE-V0-503-558-E904	QUALITY PLAN OF LIGHTING PANEL	11	8	8	18
5	PE-V0-503-558-E507	GA DRAWING OF LIGHTING TRANSFORMER	11	8	8	18
6	PE-V0-503-558-E903	QUALITY PLAN OF LIGHTING TRANSFORMER	11	8	8	18

Secondary Documents		
1	PE-V0-503-558-E508	TYPE TEST REPORTS FOR LIGHTING DISTRIBUTION BOARDS
2	PE-V0-503-558-E509	TYPE TEST REPORTS FOR LIGHTING PANELS
3	PE-V0-503-558-E510	TYPE TEST REPORTS FOR LIGHTING TRANSFORMER
4	PE-V0-503-558-E107	BILL OF MATERIAL

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DATA SHEET –A

S. No.	Description	Unit	Value
1.0	**SYSTEM DESIGN DATA**		
1.1	Design ambient	^{0}C	50
1.2	**AC Supply**		
a)	Rated voltage	V	415
b)	Rated frequency	Hz	50
c)	Voltage variation (permissible)	%	+10% to -10%
d)	Frequency variation (permissible)	%	+5% to -5%
e)	Combined voltage & frequency variation (sum of absolutes permissible)	%	10%
f)	System fault level & duration	kA, sec.	50kA for 1 sec.
1.3	**DC Supply**		
a)	Rated voltage	V	220
b)	Voltage variation (permissible)	%	+10% to -15%
c)	System fault level and duration	kA, Sec	20kA for 1 sec.

2.0 APPLICABLE STANDARDS

IS 60947	Low voltage switchgear and control gear
IS 11171	Dry type transformers
IS 13703	Low voltage fuses for voltages not exceeding 1000V AC or 1500 V
IS 10118	Code of practice for selection, installation and maintenance of switchgear and control gear
IS 60898	Electrical Accessories - circuit breakers for over protection for household and similar installations
IS 1901	Visual indicator lamps
IS 60079	Explosive atmospheres
IS 5572	Classification of hazardous areas (other than mines) having flammable gases and vapours for electrical installation
IS:2551	Danger notice plates

3.0	**LIGHTING/ WELDING DISTRIBUTION BOARDS**		
3.1	Operational Front		Single Front
3.2	Type of execution of modules (functional unit)		[√] Fixed [ ] Draw out
3.3	Type of sheet steel		CRCA
3.4	Sheet metal thickness (minimum)		
a)	Non-load bearing covers	mm	1.6 mm
b)	Non-load bearing partitions	mm	1.6 mm
c)	Load bearing members	mm	2.0 mm
d)	Frames	mm	2.0 mm
e)	Door	mm	1.6 mm
f)	Withdrawable unit (if applicable)	mm	NA
3.5	Cable alley width (minimum)	mm	400mm (Cable terminations located in cable alley shall be designed to meet the Form IVb
3.6	Bus bar material		Aluminium grade E 91E/ High conductivity copper (ETC)
3.7	Earth bus bar material		[√] GI Strip [ ] Aluminium [ ] Copper
3.8	Degree of Protection		
a)	Main Panel		IP-52 for indoor IP-54 for outdoor
b)	Transformer cubicle		IP-42 , IP-52 for transformer terminal box.
3.9	Gland plate thickness	mm	3.0
3.10	**AC LDB/ WDB**		
a)	No. of Incomers		[ ] One [√] Two (Refer BOQ for details) *(One incomer for WDB)
b)	Bus coupler required		[√] Yes (for two incomer panel)
c)	Incomer and Bus coupler rating	A	As per transformer rating
d)	Type of Incomer and Bus coupler		[ ] TPN SFU [√] TPN MCCB
e)	Type of Outgoing Feeders		[√] TPN SFU [ ] TPN MCCB
f)	Outgoing feeders rating	A	63
g)	Cable entry		[√] Bottom [ ] Top Cable termination in the cable alley of

			LDB shall confirm to Form IVb design.
3.11	**Lighting Transformer**		
a)	Rating	kVA	100/ 50
b)	Type of cooling		Air natural
c)	Voltage ratio	V	415/415
d)	Rated frequency	Hz	50
e)	No. of phases		3
f)	Vector group		Dyn1
g)	Off circuit taps		
	Tap range, steps	%	+5% to -5% in steps of 2.5%
	Voltage of each tap	V	As per manufacturer's data
h)	Impedance at rated current, frequency at 75 ^{o}C	%	100kVA – 4% 50kVA – 3%
i)	Rated current		
	Primary	A	As per manufacturer's data
	Secondary	A	As per manufacturer's data
j)	Transformer type		[√] Cast resin [√] Encapsulated [ ] Non-Encapsulated
k)	Transformer winding insulation		Class-B or better
l)	Transformer winding insulation temperature rise limit		80° C above 50° C ambient
n)	Type of ventilation arrangement provided for transformer enclosure		As per manufacturer's data
o)	Winding conductor material		Copper
p)	Iron loss at 50 Hz and 100% rated voltage	kW	As per manufacturer's data
q)	Copper loss at rated load at 75 ^{o}C	kW	As per manufacturer's data
r)	Regulation at full load at 75 ^{o}C and 0.8 p.f. lagging		As per manufacturer's data
s)	Weight	kg	As per manufacturer's data

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3.12	**DC LDB**		
a)	No of incomers		[√] One [ ] Two
b)	DC incomer type		DP Switch fuse unit with contactor
c)	DC incomer rating	A	63
d)	AC incomer type		NA
e)	AC incomer rating		NA
f)	Bus coupler required		[ ] Yes [√] No
g)	Incomer and bus coupler rating	A	63
h)	Type of bus coupler		[ ] SFU [ ] DP MCCB
i)	Type of outgoing feeders		[√] DP SFU [ ] MCCB [ ] DP MCB
j)	Outgoing feeders rating	A	32
k)	Changeover required in DC LDB		[ ] Yes (Converter for Conversion of AC to DC) [√] No
l)	Cable entry		[√] Bottom [ ] Top
m)	Under voltage relay required		[√] Yes [ ] No
n)	Power Contactor of suitable rating		[√] Yes [ ] No
4.0	**LIGHTING PANELS**		
4.1	Application		[ ] Indoor [ ] Outdoor [√] Both
4.2	Type of sheet steel		CRCA
4.3	Sheet metal thickness (minimum)	mm	2.0
3.4	Degree of Protection		
a)	Indoor panel		IP-55
b)	Outdoor panel		IP-55, Weatherproof
c)	Canopy in outdoor panel		[√] Yes [ ] No
4.5	Bus bar material		[√] Aluminium [ ] Copper
4.6	Earth bus bar required		[√] Yes [ ] No
4.7	Earth bus bar material (if applicable)		[√] GI Strip [ ] Aluminium [ ] Copper

4.8	Gland Plate	mm	3.0
4.9	Earthing studs required		[√] Yes [ ] No
4.10	Hinged door with locking facility		[√] Yes [ ] No
4.11	**AC Lighting Panel**		
a)	Incomer rating	A	63A
b)	Type of Incomer		[ ] TPN SFU [√] TPN MCCB
c)	Earth Leakage Circuit Breaker (ELCB) in incomer required		[√] Yes [ ] No
d)	Type of Outgoing Feeders (non-flameproof panel)		[√] SPN MCB [ ] TPN MCB
e)	Timer required for indoor (decorative) panel		[√] Yes [ ] No
f)	Timer required for outdoor panel		[√] Yes [ ] No
g)	Outgoing feeders rating	A	20
h)	ELCB in Incomer		[√] Yes [ ] No
4.12	**DC Lighting panel**		
a)	Incomer rating	A	32
b)	Type of incomer		[√] DP SFU [ ] DP MCCB
c)	Type of outgoing feeders (non-flameproof panel)		[√] DP MCB
d)	Type of outgoing feeders (flameproof panel)		NOT APPLICABLE
e)	Outgoing feeders rating	A	20
5.0	**COMPONENTS OF LIGHTING SYSTEM EQUIPMENT**		
5.1	**Moulded Case Circuit Breaker (MCCB)**		
a)	Rated voltage	V	415
b)	Number of poles		TPN
c)	Rated short circuit duty	kA	50
d)	Rated breaking capacity (rms)	kA	50
e)	Rated making current (peak)	kA	105
f)	Release with short circuit		[√] Yes [ ] No
g)	Release with overload		[√] Yes [ ] No

h)	Release with under voltage		[ ] Yes [√] No
i)	Auxiliary contacts		
	Numbers	NO+NC	2NO + 2NC
	Rating	A	As per manufacturer data
5.2	**Switch-Fuse Unit**		
a)	Utilisation category for main contacts		AC23
5.3	**Miniature Circuit Breaker**		
a)	SPN MCB rating (min)	A	20
b)	DP MCB rating (min)	A	20
c)	TPN MCB rating (min)	A	63
d)	Short time rating	kA	10
e)	Magnetic short circuit protection required		[√] Yes [ ] No
f)	Thermal overload protection required		[√] Yes [ ] No
5.4	**Current Transformer**		
a)	Type		Cast resin
b)	Secondary current rating	A	[√] 1 [ ] 5
c)	Burden	VA	10
d)	Accuracy class		1.0
e)	Instrument Safety Factor		<5
5.5	**Voltage Transformer**		
a)	Type		Cast resin
b)	Secondary terminal voltage (phase-phase)	V	110 V
c)	Burden	VA	10
d)	Accuracy class		1.0
e)	Winding configuration		Star/ Star
f)	System grounding		[√] Effective [ ] Non-effective
5.6	**Indicating Meters**		

5.6.1	**Ammeter**		
a)	Type		Analog
b)	Shape		Square
c)	Size		96mm x 96mm
d)	Accuracy		1.0
e)	Current coil rating	A	1
f)	Angle of deflection	deg	90
5.6.2	**Voltmeter**		
a)	Type		Analog
b)	Shape		Square
c)	Size		96mm x 96mm
d)	Accuracy		1.0
e)	AC voltage coil rating	V	0-500
f)	DC voltage coil rating	V	0-250
g)	Angle of deflection	deg	90
5.7	**Power Contactors**		
a)	Coil voltage (nominal)		
	AC contactors	V	240
	DC contactors	V	220
b)	Current rating of contacts		
	Power	A	As per manufacturer data
	Control	A	As per manufacturer data
5.8	**Under voltage relay**		
a)	Type		[√] Electromagnetic [ ] Static
b)	Coil voltage rating	V	240V AC
c)	Means for in-built testing provided		As per manufacturer data
5.9	**Timer**		

5.9.1	**Time switch**		
a)	Type		Digital synchronous
b)	Range	hr	0-24
c)	Coil voltage rating	V	240
5.9.2	**Timer for AC-DC changeover**		
a)	No. of contacts		
	ON time delay	NO+NC	As per scheme requirement
	OFF time delay	NO+NC	As per scheme requirement
	Instantaneous	NO+NC	As per scheme requirement
b)	Coil voltage rating		
	AC timer	V	240
	DC timer	V	220
c)	Time delay range		
	AC timer	sec	0-5
	DC timer	sec	0-180
5.10	**Selector switch**		
a)	Type of selector switch		[√] Stay put [ ] Wing knob
b)	Lockable		[ ] Yes [√] No
5.11	**Push Button**		
a)	Voltage grade	V	500
b)	Potential free contacts		2NO+2NC
5.12	**Indicating Lamps**		LED type
a)	Lens Colour		
	ON condition		Red
	OFF condition		Green
b)	Circuit voltage	V	240V
5.13	**Cable Glands**		**By vendor for all incoming and outgoing cables [Cable sizes shall be informed during detail engineering]**

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a)	Type		[√] Double compression [ ] Single compression
b)	Material		Heavy duty brass machine finished
c)	Nickel Plating provided		[√] Yes [ ] No
d)	Flameproof glands with flameproof equipment		[√] Yes [ ] No
5.14	**Cable Lugs**		**By vendor for all incoming and outgoing cables** **[Cable sizes shall be informed during detail engineering]**
a)	Type		Crimping type/ ring type
b)	Material		Tinned copper
6.0	**PAINTING**		
6.1	**Paint shade**		
a)	LDBs		Two coats of Red oxide primer followed by two coats of Powder coated, colour shade 9002
b)	LPs		Two coats of Red oxide primer followed by two coats of Powder coated, colour shade 9002
6.2	**Paint Finish**		
a)	Interior		[ ] Matt [√] Semi-glossy
b)	Exterior		[√] Semi-glossy [ ] Full-glossy
6.3	**Paint Thickness**	Microns	50 (minimum)

ANNEXURE-1

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES38	LIGHTING DISTRIBUTION BOARDS	1	E1007	ADVANCE ENGG. COMPANY	38,SETHI IND. ESTATE 10/E,SUREN RD,ANDHERI MUMBAI-400097	91 - 22 - 24360086	
	LIGHTING DISTRIBUTION BOARDS	2	STRG01	Sterling Generators Pvt. Ltd.	C-56/38, INSTITUTIONAL AREA, SECTOR-62, NOIDA -201307, U.P.	Nityanand Engineer-Sales & Marketing (Panel Division) Noida, UP | 201307, India Mobile-+91-8510022170	
	LIGHTING DISTRIBUTION BOARDS	3	E1091	MIKA ENGINEERS	BRANCH OFFICE : 'D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi E-mail : mika@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230 74373 ; Email: asgar@mikaengineers.com	
	LIGHTING DISTRIBUTION BOARDS	4	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LIGHTING DISTRIBUTION BOARDS	5	KM1	KMG ATOZ SYSTEMS	"ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA)	Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710	
	LIGHTING DISTRIBUTION BOARDS	6	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	LIGHTING DISTRIBUTION BOARDS	7	AVA01	AVAIODS TECHNOVATORS LTD.	PLOT NO.25 ,SECTOR-3,IMT-MANESAR, GURGEON-122050 (HARYANA)	KRISHNA KALRA- 09958096168	
	LIGHTING DISTRIBUTION BOARDS	8	ACE01	Adroit Control Engineers Pvt.Ltd.	M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL. AREA, SECTOR-25 FARIDABAD – 121004	011-47600700, 0129-4251400	
	LIGHTING DISTRIBUTION BOARDS	9	JC01	JACKSON ENGINNEERS	A-43, HOSEIRY COMPLEX, OPPOSITE NSEZ, NOIDA-201305	0120-4302600, 2568923,27	
	LIGHTING DISTRIBUTION BOARDS	10	ADL01	Adlec Systems Private Limited	PLOT NO-277, SWARN PARK, UDYOG NAGAR, MUNDKA, MAIN ROHTAK ROAD, UDYOG NAGAR, NEW DELHI, DELHI 110041	011 2834 5061	
	LIGHTING DISTRIBUTION BOARDS	11	POP01	Popular Switchgears Pvt Ltd	712, ARUN CHAMBERS, TARDEO MAIN ROAD, TARDEO, NEAR TARDEO AIRCONDITIONER MARKET, MUMBAI - 400034	-9362634406	
	LIGHTING DISTRIBUTION BOARDS	12	CS01	CANDS	J/202, ANSA INDUSTRIAL ESTATE, SAKI VIHAR ROAD, SAKINAKA, ANDHERI (EAST), MUMBAI-72	022-28570858	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LIGHTING DISTRIBUTION BOARDS	13	PYRE01	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya (psisodia@pyrotechlighting.com) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309	
	LIGHTING DISTRIBUTION BOARDS	14	PCS01	Positronics Pvt. Ltd.	POSITRONICS HOUSE ,882/ 2, G.I.D.C. MAKARPURA,VADODARA 390010 GUJARAT	+91 265 2642496 Fax: +91 265 264 7033 / 234 0944 E- mail : info@positronicsindia.com Website:www.positronicsindia.com	
	LIGHTING DISTRIBUTION BOARDS	15	ISC01	Industrial Switchgears & Control Pvt Ltd	S-02 AMARDEEP MAHAL, NANDA PATKAR RD, VILE PARLE EAST, MUMBAI - 400057	(91)-22-26182011	
	LIGHTING DISTRIBUTION BOARDS	16	VC01	M/s Vidhyut Control (I) Pvt.Ltd.	D-12 & 13, SECTOR-17, KAVI NAGAR INDL.AREA, GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA		
	LIGHTING DISTRIBUTION BOARDS	17	MIL01	MILESTONE SWITCHGEARS PVT. LTD.	MILESTONE SWITCHGEARS PVT. LTD. 97, UDYOG VIHAR, PHASE-1, GURGEON HARYANA - 122016	Phone Nos.: 0124-4994900 (30 Lines) Fax: 0124-4002973 Email: jaideep.ahuja@milestonesindia.com URL: www.milestonesindia.com	
	LIGHTING FIXTURES (NON LED)	2	E1206	BALIGA LIGHTING EQPT PVT LTD	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
	LIGHTING FIXTURES (NON LED)	3	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LIGHTING FIXTURES (NON LED)	4	B05	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;	
	LIGHTING FIXTURES (NON LED)	5	C02	CROMPTON GREAVES	3RD FLOOR, EXPRESS BUILDING,9-10, BAHADUR SHAH ZAFAR MARG, NEAR ITO CROSSING,NEW DELHI-110002, INDIA	91 11 23460700 - 999 Sunil.Das@cgglobal.com, Mr. Prashant Wewhare 9930095703	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES39	LIGHTING FIXTURES (NON LED)	6	E1051	EVERGREEN ENGG. CO.	EVERGREEN ENGG COMPANY WORKS-5, PLOT NO. 9,10,11,12, SURVEY NO. 242, CHINCH PADA, VASAI EAST-401208	(0250) 6458250	
	LIGHTING FIXTURES (NON LED)	7	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	01244606001, Sharad (+919871150447)	
	LIGHTING FIXTURES (NON LED)	8	WP01	WIPRO LTD.	WIPRO CONSUMER CARE AND LIGHTING, 5TH FLOOR, GODREJ ETERNIA -C, OLD PUNE-MUMBAI ROAD, SHIVAJINAGAR, PUNE -411005	020-66098700	
	LIGHTING FIXTURES (NON LED)	9	HP01	M/S HPL ELECTRIC & POWER PVT. LTD	M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL. AREA , KUNDLI, DIST.- SONEPAT (HARYANA) - 131028	mohitsharma@hplindia.com'	
	LIGHTING FIXTURES (NON LED)	10	SR01	SURYA ROSHNI LIMITED	PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI	011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com	
	LIGHTING FIXTURES (NON LED)	11	HI02	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING FIXTURES (NON LED)	12	HN13	M/s Halonix Technologies Limited	M/s Halonix Technologies Limited B-31 , Phase –II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305	Mr. Mohit Gautam ' 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; 'rahul.singh@halonix.co.in'	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES40	LIGHTING FIXTURES (LED)	1	NE01	Neev Luminaries	B-6/3 Okhla Industrial Area | Phase-2| New Delhi | 110020	Phone: 011 40604830-31, M:8826995888 Fax: +91 11 4060 4831 info@neevenergy.in, Jitendra Sahu <jsahu@neevenergy.com>	
	LIGHTING FIXTURES (LED)	2	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922, girish.srivastava@havells.com\	
	LIGHTING FIXTURES (LED)	3	B05	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;	
	LIGHTING FIXTURES (LED)	4	SR01	SURYA ROSHNI LIMITED	1	011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com	
	LIGHTING FIXTURES (LED)	5	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	01244606001, Sharad (+919871150447), Mr. Guruseelan M 8939693949, Mr Ashish Sethi 9007077089	
	LIGHTING FIXTURES (LED)	6	HP01	M/S HPL ELECTRIC & POWER PVT. LTD	M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL. AREA , KUNDLI, DIST.- SONEPAT (HARYANA) - 131028	mohitsharma@hplindia.com, Mr. Nitesh Verma 8851036938, Mr Ajay lakra 9560045423	
	LIGHTING FIXTURES (LED)	7	INS1	INSTA POWER	PLOT NO. - 457 PHASE - V, UDYOG VIHAR, GURGAON - 122016	124-4124000, Mr amit Bhardwar: 8800508090	
	LIGHTING FIXTURES (LED)	8	PT13	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya : 9314310042(psisodia@pyrotechlighting.com) Ms Ritika 9509245814	
	LIGHTING FIXTURES (LED)	9	HN13	M/s Halonix Technologies Limited	M/s Halonix Technologies Limited B-31 , Phase –II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305	Mr. Mohit Gautam ' 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; M: 9891868793'rahul.singh@halonix.co.in'	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LIGHTING FIXTURES (LED)	10	JA13	M/s JAQUAR & COMPANY PVT. LTD.	M/s JAQUAR & COMPANY PVT. LTD. Plot No.3 , Sector M-11, IMT Manesar. Gurgaon· 122050 Haryana	Mr. Dhruv Kumar ' 'Tel: +919350043727 dhruv.kumar@jaquar.com ; gaurav.bhalla@jaquar.com : 9582950282	
	LIGHTING FIXTURES (LED)	11	CR13	M/s CROMPTON GREAVES CONSUMER ELECTRICALS LTD.	M/s CROMPTON GREAVES CONSUMER ELECTRICALS LTD.Tower-3, 1st Floor, East Wing Equinox Business Park LBS Marg, Kurla (West), Mumbai-400070	Mr S L Sivakumar 'Sivakumar L' <sivakumar.sl@crompton.co.in> M: 9176609363	
	LIGHTING FIXTURES (LED)	12	WI13	M/s WIPRO ENTERPRISES PRIVATE LTD.	M/s WIPRO ENTERPRISES PRIVATE LTD. L-8, MIDC Waluj, Aurangabad-431136, Maharashtra, India	Ms Dhanya K K 'dhanya.kk8@wipro.com' M 9891815476, Mr Puneet kalia 'puneet.kalia@wipro.com'	
	LIGHTING FIXTURES (LED)	13	NI13	M/s Nessa Illumination Technologies Pvt. Ltd.	M/s Nessa Illumination Technologies Pvt. Ltd.36/A Devraj Industrial Park, Opp. Sameep Fabrics, Pipalaj Pirana Road, Piplaj, Ahmedabad	Mr. Dhaval Shah <dhaval@nessa.in> M 9825650354, Mr. Akshat Khare <akshat@nessa.in> M: 9016111723	
	LIGHTING FIXTURES (LED)	14	FE13	M/s. Forus Electric Pvt. Ltd.	M/s. Forus Electric Pvt. Ltd. B-313, Okhla Industrial Area, Phase-1, New delhi-110020	Mr. Amit Bharadwaj <amit.bharadwaj@foruselectric.com> M 8800508090, Mr. Uttam Goyal <uttam@foruselectric.com> M: 8527652687	
	LIGHTING FIXTURES (LED)	15	OE13	M/s. ORIENT ELECTRIC LIMITED.	C- 130, Sector-63, Noida-201301, Uttar Pradesh, D-209, Sector-63, Noida-201301, Uttar Pradesh	Birjendra Kumar Yadav <birjendra.yadav@orientelectric.com> P. +91-120-4894900 , +91-9599848491	
	LIGHTING FIXTURES (LED)	16	ME13	M/s Mika Engineers	Survey no. 47, shed no. 2, AGHAI, Shahpur-wada road, AGHAI Thane, Maharashtra-421601	''deepak'' <deepak@mikaengineers.com>MOB: 8976737543	
	LIGHTING FIXTURES (LED)	17	KI13	M/s Kalingia Illuminaton Pvt Ltd.	15/3/2 SITE-IV SAHIBABAD INDUSTRIAL AREA GHAZIABAD UP 201010	Bidyut Mandal' <bidyut.mandal@kalingialights.com> (M: 9555367941 / 9315029882), 'Suresh Shiromani' <suresh.shiromani@kalingialights.com>, 'info@kalingialights.com',	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES41	LIGHTING FIXTURES (FLAME PROOF)	1	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING FIXTURES (FLAME PROOF)	2	B05	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;	
	LIGHTING FIXTURES (FLAME PROOF)	3	E1206	BALIGA ELECTRICALS	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
ES46	LIGHTING TRANSFORMER	1	E1021	AUTOMATIC ELECTRIC LTD.	ADDRESS : 96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LIGHTING TRANSFORMER	2	E1066	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	
	LIGHTING TRANSFORMER	3	E1103	POWER PACK ENTERPRISES	POWER PACK ENTERPRISES MR. NEHAL SHAH / MR. SHARAD SHAH (PARTNER) NO. 3, JAYSHREE SADAN, 1ST FLOOR, OLD NAGARDAS ROAD, ANDHERI EAST MUMBAI - 400069, MAHARASHTRA, INDIA	Call Us:08447573761 Mobile: +(91)-9821787821 +(91)-9821035604	
	LIGHTING TRANSFORMER	4	E1155	VIJAY ELECTRICALS LTD.	6-3-648/1&2, OFF RAJ BHAVAN ROAD, SOMAJIGUDA, HYDERABAD - 500 082. ANDHRA PRADESH, INDIA.	Vijay Electricals Mr. Bharat Giri / Ajay Giri (CEO) B 79, Gali No. 60, Sanjay Colony, Sector- 23 Faridabad - 121005, Haryana, India Call Us: 09953353612 websales@vijaielectricals.com	
	LIGHTING TRANSFORMER	5	E1057	GILBERT & MAXWELL	WORKS PLOT G-28 , M.I.D.C., AMBAD NASHIK - 422010, MAHARASHTRA, INDIA	Mr. Sanjeev Kulkarni, (Marketing Manager) | Cell: 9822586724 sanjeevkulkarni@gilbert-maxwell.in Phone : + 91 - 253 - 238 25 51 Fax : + 91 - 253 - 238 25 52	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LIGHTING TRANSFORMER	6	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 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	
	LIGHTING TRANSFORMER	7	AIE01	Ames Impex Electricals Pvt. Ltd	C-1B/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330	Phone:079 2282 1648	
ES49	LIGHTING PANEL (FLAME PROOF)	1	E1206	BALIGA ELECTRICALS	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
	LIGHTING PANEL (FLAME PROOF)	2	SS01	SUDHIR SWITCHGEAR	305/6, APEEJAY HOUSE, 130, BOMBAY SAMACHAR MARG, MUMBAI - 400 023. INDIA	Telephone Nos. : 40460000 (100 lines) Fax Nos. : ++-91-22-22049381 Email : md@sudhirswitchgears.com ; works@sudhirswitchgears.com ;scud@vsnl.com	
	LIGHTING PANEL (NON FLAME PROOF)	1	E1091	MIKA ENGINEERS	D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi E-mail : mika@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230	
	LIGHTING PANEL (NON FLAME PROOF)	2	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LIGHTING PANEL (NON FLAME PROOF)	3	VC01	Vidhyut Controls (India) Pvt. Ltd.	M/S VIDHYUT CONTROL (I) PVT.LTD. D-12 & 13, SECTOR-17,KAVI NAGAR INDL.AREA,GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA	0120-4186400, 0120-4186423, 8527005590(DK GUPTA)	
	LIGHTING PANEL (NON FLAME PROOF)	4	KM1	KMG ATOZ SYSTEMS	"ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA)	Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710	
	LIGHTING PANEL (NON FLAME PROOF)	5	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	LIGHTING PANEL (NON FLAME PROOF)	6	AVA01	AVAIODS TECHNOVATORS LTD.	PLOT NO.25 ,SECTOR-3,IMT-MANESAR, GURGEON-122050 (HARYANA)	KRISHNA KALRA- 09958096168	
	LIGHTING PANEL (NON FLAME PROOF)	7	ACE01	Adroit Control Engineers Pvt.Ltd.	M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL. AREA, SECTOR-25 FARIDABAD – 121004	011-47600700, 0129-4251400	
ES50	LIGHTING PANEL (NON FLAME PROOF)	8	JC01	JACKSON ENGINNEERS	A-43, HOSEIRY COMPLEX, OPPOSITE NSEZ, NOIDA-201305	0120-4302600, 2568923,27	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LIGHTING PANEL (NON FLAME PROOF)	9	MIL01	MILESTONE SWITCHGEARS PVT. LTD.	MILESTONE SWITCHGEARS PVT. LTD. 97, UDYOG VIHAR, PHASE-1, GURGEON HARYANA - 122016	Phone Nos.: 0124-4994900 (30 Lines) Fax: 0124-4002973 Email: jaideep.ahuja@milestonesindia.com URL: www.milestonesindia.com	
	LIGHTING PANEL (NON FLAME PROOF)	10	PCS01	Positronics Pvt. Ltd.	POSITRONICS HOUSE ,882/ 2, G.I.D.C. MAKARPURA,VADODARA 390010 GUJARAT	+91 265 2642496 Fax: +91 265 264 7033 / 234 0944 E- mail : info@positronicsindia.com Website:www.positronicsindia.com	
	LIGHTING PANEL (NON FLAME PROOF)	11	PYRE01	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya (psisodia@pyrotechlighting.com) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309	
ES87	DICHORIC SPOT LIGHTING FIXTURE	REPUTED MAKE					

309504/2024/PS-PEM-EL

ADDITIONAL APPROVED SUB-VENDOR LIST

	Project: PARICHHA-II (2X210MW)	ELECTRICAL ITEMS	Doc No
UPRVUNL	Package : ESP RETROFIT PACKAGE	INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL	Rev No 0
			Date 13.03.2019
	Contract No.:		Page 4 of 9 .

Sl No	ITEM	QP / Insp. Cat.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Remark
10	Floor mounted Fixed type Indoor LT Switchgear Panel (ACDB / DCDB / Lighting DB/ Solenoid valve distribution Boards)	I	Switching Circuits	Kolkata	A	
			Tricolite	Sahibabad / Manesar	A	
			Hindustan Control & equipment Ltd	Kolkata	A	With fabrication & painting at unit II & MP Electrical Narendrapur
			Maktel	Vadodara	A	
			Jakson	Greater Noida	A	
			Vidyut Control	Gaziabad	A	
			Adlec Power	Rohad (Jhajjar)	A	
			Pyrotech	Udaipur	A	
			Anand Power Ltd.	Noida	A	
			L&T	Mumbai / Coimbatore	A	
			GE	Bangalore	A	
			Siemens	Mumbai	A	
			C&S Electric	Noida / Hardwar	A	
			Schneider	Nasik	A	ACB from Schneider, France
			Unilec	Gurgaon	A	ACB from Owner aprvd soures
11	Wall mounted fixed type indoor/ outdoor LT Switchgear non compartmentalized Panel (Lighting panels / AC / DC Fuse boards / MCB boxes)	I	Positronics	Vadodara	A	
			Pyrotech	Udaipur	A	
			Control Devices	Kolkata	A	
			Jasper	Noida	A	
			Conquerent Control Systems	Manesar	A	
			Havells	Faridabad	A	
			Novateur Electrical & distribution systems	Murthal	A	
			Avaid Technovator	Manesar	A	
			Additionally all vendors identified in seriel no. 5 are also		A	
12	Insulators (Bushing, Support , Shaft)	II	BHEL EPD	Bangalore	A	
		II	XUANHUA XINDI INSULATOR CORP. LTD.	CHINA	A	
13	Disconnecting Switch	III	Win Power	Kolkata	A	Insulator make shall be BHEL/WSI/JSI/UCE/ Aditya Birla
			Main Contractor Approved Sources		A	
14	Panel Type Hopper Heater	II	HTD	USA	A	
		II	Hotfoil EHS	USA	A	
		I	HTD HEAT TRACE(I) Pvt Ltd	Hyderabad	A	
		II	Thermon	USA	A	
		I	Thermopads(Unit-II)	Jeedimetla	A	
		I	Thermon	Pune	A	
15	Tubular Type Heater	II	Main Contractor Approved Sources		A	

309504/2024/PS-PEM-EL

	Project: PARICHHA-II (2X210MW)	**ELECTRICAL ITEMS**	Doc No
UPRVUNL	Package : ESP RETROFIT PACKAGE	**INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL**	Rev No 0
			Date 13.03.2019
	Contract No.:		Page 7 of 9 .

Sl No	ITEM	QP / Insp. Cat.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Remark
21	CABLE TRAY FLEXIBLE SUPPORT SYSTEM (Refer Note-3)	Refer Note: 3	Vatco	Mumbai	A	Galvanising at Sigma Mumbai
			Inar profiles	Enkapalli	A	
			Industrial perforations	Kolkata	A	
			Premier power products	Kolkata	A	Galvanising at Neha Galvaniser
			Steelite engg.	Mumbai	A	
			Indiana gratings	Pune	A	Galvanising at Poona Galvaniser
			Amtech	Pune	A	Galvanising at B.G. Shirke
22	LT Busduct	I	KGS Engg	Chennai	A	
			Spaceage	Gurgaon	A	
			C&S	Noida/Haridwar	A	RQP
			Unilec	Gurgaon	A	
			REEP	Chennai	A	
23	Lighting Transformer (Epoxy Insulated)	II	Gujarat Plug In	Vadodara	A	SQP
			Prayog	Pune	A	SQP
			Indcoil	Mumbai	A	SQP
			Pragati	Thane	A	SQP
			Southern Elect	Chennai	A	SQP
			Pactil	Thane	A	SQP
			AE	Mumbai	A	SQP
			KPEL	Pune	A	SQP
24	Lighting Fixtures & Luminaries	III	Wipro	Pune	A	
			Crompton	Mumbai	A	
			Philips	Pune	A	
			Bajaj	Mumbai	A	
25	Welding Recepticles	III	SCHEINDER	Nasik	A	
			AJMERA	Mumbai	A	
			Best & Cropmpton	Chennai	A	
			BCH	Faridabad	A	
26	Lighting Wires / GI Conduit	III	BIS Licencee		A	Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number.
27	Cable Gland	III	Arup Engg	Kolkatta		Any other make with VDE or CE or UL or CSA marking or BIS approved with valid CML number.
			Sunil & Co	Kolkatta	A	
			Quality Preceision	Kolkatta	A	
			Comet	Mumbai	A	
28	Lugs	III	Dowells	Mumbai	A	Any other make with VDE or CE or UL or CSA marking or BIS approved with valid CML number.
			Chetna	Nasik	A	
			3D	Umbergaon	A	
29	Emergency Light, Trefoil Clamps, Ceiling Fans	III	Main Contractor Approved Sources		A	
30	M.S. ROD, G.I. Flat, G.I. Wire, Earth Wire	III	Main Contractor Approved Sources		A	GALVANISING AT Owner APPROVED SOURCES
31	Local Motor Starter Panels	III	SIEMENS	Mumbai	A	Any other make with VDE or CE or UL or CSA marking or BIS approved with valid
			L&T	Mumbai	A	

PACKING SPECIFICATION FOR DISTRIBUTION BOARDS PACKAGE (LIGHTING DISTRIBUTION BOARDS AND LIGHTING PANELS)

ANNEXURE - I

DISTRIBUTION BOARDS (LDB & LP) shall be despatched in "Crate Packing" using wood.

1.0 PREPARATION OF PACKING CASES:

1.1 **DIMENSIONS:**

1.1.1 Minimum number of planks shall be used for a shook.
1.1.2 Thickness of planks for Front, rear, top and bottom sides and binding, jointing battens shall be 25/20mm +2/-3 mm
1.1.3 Horizontal, vertical, diagonal planks shall be given for binding
1.1.4 Width of binding planks shall be minimum 100mm
1.1.5 Distance between any 2 binding planks shall be less than 750mm
1.1.6 Diagonal planks shall be used in between vertical binding planks when distance between inner to inner of vertical planks is more than 750mm
1.1.7 Distance of the outer edges of these planks from the edge of case shall be less than 250mm.
1.1.8 Diagonal planks are not required for top planks and width side, if the width of pallet is less than 750mm.

1.2 JOINTING OF PLANKS**:**

Single length planks shall be used for cubicles whose overall length is less than 2400 mm. For cubicles of length more than 2400 mm, jointing is permitted. The jointing shall be done with one single or maximum of 2 planks of wood same as other planks of width 250 mm (minimum) with two rows of nails on either side of the joint in zigzag manner. From the joint along height side, it shall be of lap joint with overlap of at least the width of plank.

1.3 PERMISSIBLE DEFECTS

Wood shall be free from knots, bows, visible sign of infection and any kind of decay caused by insects, fungus, etc.

End splits: Longest end splits at each end shall be measured and lengths added together. The added length shall not exceed 60mm per meter run of shook's. Wood pins shall be used to prevent further development of split.

Surface cracks: Surface cracks with a maximum depth of 3mm are permissible. A continuous crack of any depth all along the length is not allowed.

1.4 OTHER MATERIALS

1.5.1 NAILS

Nils of suitable dia and length shall be used for joining the planks.

1.5.2 BLUE NAILS

If applicable, these shall be used for nailing bituminized Kraft paper/hessian cloth to the planks.

1.5.3 HOOP IRON STRIPS
These are used for strapping the boxes. The material shall be free from rust. If sufficient nailing is done for bigger boxes, strapping need not be done.

1.5.4 CLIPS

These shall be used for strapping the hoop iron strips on the boxes.

1.5.5 BRACKETS

Brackets of suitable dimension shall be used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of suitable thickness. The brackets shall be of “L" shape. Two holes shall be provided towards the end of each side for screwing /nailing.

1.5.6 MULTI LAYERED CROSS LAMINATED POLYTHELENE FILM

Multi Layered Cross Laminated Polyethylene Film shall be used to make covers to the jobs individually. The cross lamination gives qualities of extra toughness, together with flexibility and lightness coupled with good weather resistance to ultra violet rays.

1.5.6 RUBBERISED COIR:

The rubberized coir is used as cushioning material. For the packing of loose items, items are to be arrested by using rubberized coir.

1.5.7 FASTENERS

Bolts, double nuts, spring washers will have to be used to hold the job to the bottom plank of the box so that there shall be no jerk on the DISTRIBUTION BOARDS (LDB & LP) during transit.

1.5.8 PACKING SLIP:

Packing slip kept in the polyethylene bag shall be placed in the box at appropriate place. In addition, one more packing slip covered in polyethylene cover and packing slip holder shall be nailed to front / rear of case.

1.5.9 MARKING PLATE:

Marking on the packing case shall be done as per the manufacturer standard.

DATA SHEET –C

S. No.	Description	Unit	Value
1.0	**SYSTEM DESIGN DATA**		
1.1	Design ambient	^{0}C	
1.2	**AC Supply**		
a)	Rated voltage	V	
b)	Rated frequency	Hz	
c)	Voltage variation (permissible)	%	
d)	Frequency variation (permissible)	%	
e)	Combined voltage & frequency variation (sum of absolutes permissible)	%	
f)	System fault level & duration	kA, sec.	
2.0	APPLICABLE STANDARDS IS 60947 Low voltage switchgear and controlgear IS 11171 Dry type transformers IS 13703 Low voltage fuses for voltages not exceeding 1000V AC or 1500 V IS 10118 Code of practice for selection, installation and maintenance of switchgear and controlgear IS 60898 Electrical Accessories - circuit breakers for over protection for household and similar installations IS 1901 Visual indicator lamps IS 60079 Explosive atmospheres IS 5572 Classification of hazardous areas (other than mines) having flammable gases and vapours for electrical installation IS:2551 Danger notice plates		
3.0	**LIGHTING/ WELDING DISTRIBUTION BOARDS**		
3.1	Operational Front		
3.2	Type of execution of modules (functional unit)		
3.3	Type of sheet steel		
3.4	Sheet metal thickness (minimum)		
a)	Non-load bearing covers	mm	

b)	Non-load bearing partitions	mm	
c)	Load bearing members	mm	
d)	Frames	mm	
e)	Door	mm	
f)	Withdrawable unit (if applicable)	mm	
3.5	Cable alley width (minimum)	mm	
3.6	Bus bar material		
3.7	Earth bus bar material		
3.8	Degree of Protection		
a)	Main Panel		
b)	Transformer cubicle		
3.9	Gland plate thickness	mm	
3.10	**AC LDB/ WDB**		
a)	No. of Incomers		
b)	Bus coupler required		
c)	Incomer and Bus coupler rating	A	
d)	Type of Incomer and Bus coupler		
e)	Type of Outgoing Feeders		
f)	Outgoing feeders rating	A	
g)	Cable entry		
3.11	**Lighting Transformer**		
a)	Rating	kVA	
b)	Type of cooling		
c)	Voltage ratio	V	
d)	Rated frequency	Hz	
e)	No. of phases		
f)	Vector group		

g)	Off circuit taps		
	Tap range, steps	%	
	Voltage of each tap	V	
h)	Impedance at rated current, frequency at 75 ^{o}C	%	
i)	Rated current		
	Primary	A	
	Secondary	A	
j)	Transformer type		
k)	Transformer winding insulation		
l)	Transformer winding insulation temperature rise limit		
n)	Type of ventilation arrangement provided for transformer enclosure		
o)	Winding conductor material		
p)	Iron loss at 50 Hz and 100% rated voltage	kW	
q)	Copper loss at rated load at 75 ^{o}C	kW	
r)	Regulation at full load at 75 ^{o}C and 0.8 p.f. lagging		
s)	Weight	kg	
4.0	**LIGHTING PANELS**		
4.1	Application		
4.2	Type of sheet steel		
4.3	Sheet metal thickness (minimum)		
3.4	Degree of Protection		
a)	Indoor panel		
b)	Outdoor panel		

	TECHNICAL SPECIFICATION FOR DISTRIBUTION BOARDS	SPECIFICATION NO. PE-TS-503-558-E002	
		VOLUME II	
		SECTION - I	
	2x210 MW PARICHHA TPS STAGE-II ESP (R&M)	REV. 0	DATE: 14.05.2024
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c)	Canopy in outdoor panel		
4.5	Bus bar material		
4.6	Earth bus bar required		
4.7	Earth bus bar material (if applicable)		
4.8	Gland Plate	mm	
4.9	Earthing studs required		
4.10	Hinged door with locking facility		
4.11	**AC Lighting Panel**		
a)	Incomer rating	A	
b)	Type of Incomer		
c)	Earth Leakage Circuit Breaker (ELCB) in incomer required		
d)	Type of Outgoing Feeders (non-flameproof panel)		
e)	Timer required for indoor panel		
f)	Timer required for outdoor panel		
g)	Timer required Street Light panel/ High mast feeder pillar		
h)	Photocell required for Street Light panel/ High mast feeder pillar		
i)	Outgoing feeders rating	A	
5.0	**COMPONENTS OF LIGHTING SYSTEM EQUIPMENT**		
5.1	**Moulded Case Circuit Breaker (MCCB)**		
a)	Rated voltage	V	
b)	Number of poles		
c)	Rated short circuit duty	kA	
d)	Rated breaking capacity (rms)	kA	
e)	Rated making current (peak)	kA	
f)	Release with short circuit		

g)	Release with overload		
h)	Release with under voltage		
i)	Auxiliary contacts		
	Numbers	NO+NC	
	Rating	A	
5.2	**Switch-Fuse Unit**		
a)	Utilisation category for main contacts		
b)	Number of poles		
5.3	**Miniature Circuit Breaker**		
a)	SPN MCB rating (min)	A	
b)	DP MCB rating (min)	A	
c)	TPN MCB rating (min)	A	
d)	Short time rating	kA	
e)	Magnetic short circuit protection required		
f)	Thermal overload protection required		
5.4	**Current Transformer**		
a)	Type		
b)	Secondary current rating	A	
c)	Burden	VA	
d)	Accuracy class		
e)	Instrument Safety Factor		
5.5	**Voltage Transformer**		
a)	Type		
b)	Secondary terminal voltage (phase-phase)	V	
c)	Burden	VA	
d)	Accuracy class		
e)	Winding configuration		

f)	System grounding		
5.6	**Indicating Meters**		
5.6.1	**Ammeter**		
a)	Type		
b)	Shape		
c)	Size		
d)	Accuracy		
e)	Current coil rating	A	
f)	Angle of deflection	deg	
5.6.2	**Voltmeter**		
a)	Type		
b)	Shape		
c)	Size		
d)	Accuracy		
e)	AC voltage coil rating	V	
f)	DC voltage coil rating	V	
g)	Angle of deflection	deg	
5.6.3	**Energy meter (if applicable)**		
a)	Type		
b)	Accuracy		
c)	Current coil rating	A	
d)	Voltage coil rating	V	
5.7	**Power Contactors**		
a)	Coil voltage (nominal)		
	AC contactors	V	
	DC contactors	V	
b)	Current rating of contacts		
	Power	A	

	Control	A	
5.8	**Under voltage relay**		
a)	Type		
b)	Coil voltage rating	V	
c)	Means for in-built testing provided		
5.9	**Timer**		
5.9.1	**Time switch**		
a)	Type		
b)	Range	hr	
c)	Coil voltage rating	V	
5.10	**Selector switch**		
a)	Type of selector switch		
b)	Lockable		
5.11	**Push Button**		
a)	Voltage grade	V	
b)	Potential free contacts		
5.12	**Indicating Lamps**		
a)	Lens Colour		
	ON condition		
	OFF condition		
b)	Circuit voltage	V	
5.13	**Cable Glands**		
a)	Type		
b)	Material		
c)	Nickel Plating provided		
d)	Flameproof glands with flameproof equipment		

5.14	**Cable Lugs**		
a)	Type		
b)	Material		
6.0	**PAINTING**		
6.1	**Paint shade**		
a)	LDBs		
b)	LPs		
6.2	**Paint Finish**		
a)	Interior		
b)	Exterior		
6.3	**Paint Thickness**	Microns	

SECTION – II

STANDARD TECHNICAL REQUIREMENTS

1.0 INTENT OF SPECIFICATION

1.1 The requirements given in specification shall be fully complied with.

1.2 The “design” shall broadly cover the selection of components, materials, sizes etc. for the equipment of supply in vendor’s scope. Complete responsibility of establishing the correctness of equipment design rests with the vendor.

1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship, and shall be capable of performing required function in a manner acceptable to Purchaser, who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgement is not in full accordance herewith.

1.4 Make of all equipment and components shall be to the approval of Purchaser.

2.0 CODES & STANDARDS

2.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.

2.2 The material, construction, manufacture, inspection and testing shall conform to the latest revisions of standards as specified in Data Sheet A.

2.3 In case of conflict between the applicable reference standard and this specification, stringent requirement shall govern.

3.0 DESIGN REQUIREMENTS

3.1 LIGHTING DISTRIBUTION BOARD (LDB) / WELDING DISTRIBUTION BOARD (WDB)

3.1.1 General Requirements of LDBs/ WDBs

a) LDB/WDB shall be totally enclosed, modular in construction, indoor type and suitable for electrical system data as specified in Data Sheet-A. The LDB/ WDB shall be free standing type suitable for installation on cable trenches / floor.

b) LDB/ WDB shall consist of dust and vermin proof cubicles without the use of louvers (except the transformer compartment, where applicable).

c) Good quality synthetic rubber / neoprene gaskets shall be put around the door, cover edges and cut-out edges for push button, lamps etc. for protection against dust. The door when closed, shall compress the gasket uniformly.

d) Cut-out edges for instruments, relays etc. shall have sufficient overlap surface to minimize the dust entry. The arrangement for the front mounting of switch

handles shall render the LDB/ WDB reasonably dust free such that the normal operations are not affected.

e) The LDB/ WDB shall be designed to prevent contact with live parts both within the modules and in the cable alley.

f) The bidder shall be responsible to check and coordinate the MCB characteristic with back up fuses etc. provided.

g) All equipment shall be constructed of non-hygroscopic and non-inflammable materials.

h) All components mounted in the LDB/ WDB shall be accessible and shall not impede access to wiring or terminals. All faults except busbar fault which may occur within any individual unit shall be confined within that unit only and shall not cause shutdown of any section of the board other than the affected unit itself. Maintenance and inspection shall be possible in any individual unit without affecting other units.

i) Incoming unit shall comprise of either switch-fuse/ composite switch-fuse unit or MCCB as per Data Sheet A. Outgoing units shall be either switch-fuse/ composite switch-fuse unit or MCCB as per data Sheet A.

j) Interlock between compartment door and modules shall be provided such that the door cannot be opened without switching off the power supply to the module.

k) Defeat interlock shall be provided for the units comprising of switch or moulded case circuit breaker as a means of isolation device, such that it is possible to open the door with device ON. It shall not be possible to close the door till the interlock has been reinstated.

l) Each LDB/ WDB shall be fitted with base frame made of angle or channel.

m) All fixing nuts and bolts together with grounding bolts shall be provided.

n) Lifting lugs shall be provided for each shipping section of LDB/ WDB. Removal of such lugs or hooks shall leave no opening in the LDB/ WDB.

3.1.2 LDB/ WDB with transformers (Additional Features)

a) The LDB/ WDB shall be arranged in two adjacent but separate compartments, one compartment for the lighting transformer and the other for the incoming & outgoing feeders etc.

b) The transformer shall be mounted on the base channel and it shall be possible to easily remove the transformer from the cubicle after opening the door. Necessary portable ramp made of mild steel shall be supplied along with each LDB/ WDB.

c) Independent gasket hinged door with operating handle shall be provided for access to transformer & its taps. Operating handle shall have built-in key locking arrangement.

d) Suitable ventilation arrangement for the transformer compartment to dissipate the heat of the transformer shall be provided. The arrangement shall be in the form of louvers and the same shall be provided with galvanised wire mesh with dust catchers on the inside.

e) Connections between transformer secondary terminals and the busbars shall be made by using PVC insulated flexible copper cables or busbars.

f) Warning plate shall be provided on transformer enclosure. The inscription of warning plate shall be as given below:

- DO NOT OPEN DOORS WHEN ENERGISED
- KEEP TAPS AT SAME POSITION FOR ALL PHASES

g) Transformer enclosure shall be provided with a danger plate.

3.1.3 Lighting Transformer/ Welding Transformer

a) Transformer, where specified, shall form an integral part of LDB/ WDB.

b) Lighting transformer shall be dry type, natural air cooled and suitable for mounting inside the lighting distribution board. Transformer particulars shall be as specified in Data Sheet A.

c) Rating of transformer shall be as per BOQ.

d) Winding shall be of copper material and maximum winding temperature at full load and under site conditions shall not exceed 120 ^{o}C.

e) Transformer shall be suitable for cable connections on the primary side and flexible cable or busbar connection on the secondary side.

f) The secondary neutral of the transformer shall be brought out for getting a grounded 4 wire supply system.

g) The transformer neutral shall be brought outside the LDB/ WDB for earthing. The neutral bus bar shall be insulated from the LDB/ WDB enclosure.

h) Transformers shall be provided with the rollers, pulling holes, lifting lugs, jacking positions etc.

3.1.4 Busbars, Connections and Joints

a) Busbars shall be supported on non-hygroscopic and non-inflammable insulators of material such as glass reinforced moulded plastic material, epoxy cast resin

etc. Separate supports shall be provided for each phase of the busbars. Insulation level of neutral busbar shall be same as that of phase busbars.

b) Busbars shall be contained in a separate vermin-proof compartment within the LDB/ WDB and shall have bolted sheet steel covers for providing suitable access.

c) Busbar clearances in the air shall be as per applicable standard for 415V, 3 phase system.

d) Temperature for busbars, droppers and connections shall not exceed 90 deg.C for an ambient of 50 deg.C while carrying maximum continuous current.

e) The busbar, busbar connections and supports shall have sufficient strength to withstand thermal and electromechanical stresses produced by the specified short circuit level of the system.

f) Busbars (including neutral busbar) shall be capable of carrying the short-time current specified in Data Sheet A. The duration of short-time current shall be 1 sec unless mentioned otherwise in Data Sheet A. For the specified current and duration, there shall be no damage to the equipment.

g) The neutral bus shall be rated same as phase bus.

h) Main busbars and connections shall be prominently marked and displaced for standard sequence counting from rear to front, top to bottom, or left to right as viewed from the switching device operating mechanism side.

i) Busbars and connections shall be provided with colour coded PVC sleeves. All live parts shall be properly shrouded with insulating material.

j) Earth busbar shall be provided separately.

k) Busbar Joints

- Busbar and tap off joints shall be bolted type.
- Busbars shall be thoroughly cleaned before jointing. Suitable contact grease shall be applied to remove oxide film just before jointing.
- For copper busbars, the connecting portion shall be tinned or silver plated.

3.1.5 Wiring and Terminals

a) All internal wiring for connections to remote equipment shall be brought to terminal boards. Spare contacts of devices shall also be wired upto terminal board as per schemes. Wires shall not be jointed or teed-off except at terminal points.

b) Wiring shall be made by 1100 volt grade three / seven strand PVC insulated copper wire having a cross-sectional area of not less that 1.5 sq.mm. All

connections from CT leads upto instruments, terminals shall be made by copper wires of minimum 2.5 sq.mm size.

c) All wiring shall be made with the Colour Codes specified below :

i) 3 phase AC Connections

Phase 1 (R)	Red
Phase 2 (Y)	Yellow
Phase 3 (B)	Blue
Neutral	Black

ii) 1 phase AC Connections

Phase	Red / Yellow / Blue (as per associated circuit)
Neutral	Black

iii) DC Connections

Positive	White
Negative	Grey

iv) Earth Connection Green

d) Where wiring passes from one compartment to another, the aperture shall be 'Bushed' to prevent damage to wires against sheet metal edges. Bushes may comprise of good quality rubber / PVC grommets.

e) Every wire end shall be fitted with numbered ferrules of white or yellow colour having glossy finish with identification number engraved in black. Ferrules shall be made of moisture and oil resisting insulating material. Ferrules shall be of interlocked type or tight fitting type. Ferrules shall be so fitted that they will not get detached, when the wire is removed from the terminal.

f) System of marking of wiring shall be as per applicable standard.

g) All wires used internally shall have crimped on tinned copper lugs for terminations.

h) Terminal boards shall be stud type with insulating barriers of adequate height.

i) Terminal boards shall have separate terminals for incoming and outgoing wires with not more than two wires connected to any one terminal.

j) Terminal boards shall be mounted vertically or in the horizontal rows and properly spaced to have clean wiring arrangement, adequate access for putting ferrules, making terminations etc. It shall be possible to read the ferrule numbers when the wiring is complete. Where terminals may be live when the equipment is isolated from the main supply, these shall be clearly marked near the terminal boards.

3.1.6 Cable Terminations

a) All cables, either incoming or outgoing to the LDB/ WDB, shall be terminated in a cable chamber. For each panel, there shall be a cable chamber on the side. The door of cable chamber should open or be locked with the help of a tool. Unless stated otherwise in Data Sheet A, all cables shall enter from the bottom.

b) Removable undrilled gland plates of sheet steel shall be provided in the cable chamber for entry of cables. Minimum thickness of gland plate shall be as per Data Sheet-A. The gland plate shall be of adequate size for connecting requisite number of cable glands for power and control cables.

c) Heavy duty bolt-on termination tinned copper lugs of compression type shall be used for power cable termination. The tinned copper cable lugs for all incoming and outgoing power cables shall be supplied by the vendor.

d) For supporting and clamping of cable cores at regular interval in cable alleys, suitable slotted angle upto the respective terminal blocks shall be provided.

3.1.7 Earthing

a) An earth busbar of adequate size of shall be provided at the bottom for the entire length of the LDB/ WDB. Material of earth busbar shall be GI unless mentioned otherwise in Data Sheet A.

b) Every metal part other than those forming parts of an electrical circuit shall be connected to the earth bus by means of high conductivity copper wire of size not less than 2.5 sq. mm. cross-sectional area.

c) Doors shall have a flexible copper wire for earth connection to fixed unit.

d) Each LDB/ WDB shall be fitted with two earthing studs located in accessible position on sides for connection of internal earth busbar to the external earthing connection.

e) Earth busbar shall be brought outside LDB/ WDB for making external connections.

3.1.8 Types of LDB/ WDB

a) The LDB/ WDB shall be of following type:

- LDB/ WDB-H (n) - AC LDB/ WDB with 100 kVA transformer
- LDB/ WDB-F (n) - AC LDB/ WDB with 50 kVA transformer
- LDB/ WDB-N (n) - AC LDB/ WDB with no transformer
- LDB-D (n) - DC LDB

NOTE: (n) indicates number of outgoing feeders.

b) AC LDB/ WDB (LDB/ WDB-H, LDB/ WDB-F, LDB/ WDB-N)

Each LDB/ WDB shall comprise of the following and comply with Data Sheet A:

i. One lighting/welding transformer (LDB/WDB-H & LDB/WDB-F).

ii. Incomer(s) of TP / TPN switch-fuse unit or MCCB / MCCB with neutral link as per Data Sheet A. It shall be provided on the primary side of transformer for LDB/WDB type LDB/WDB-H & LDB/WDB-F.

iii. Set of busbars with 3 phase and neutral.

iv. TPN switchfuse units or MCBs for each outgoing circuit.

v. Three indicating lamps with fuses for indicating bus supply ON.

vi. CT operated ammeter with selector switch.

vii. VT operated voltmeter with selector switch.

viii. Power & control terminals, earth-stud, earth busbar, designation labels, internal wiring, power cable lugs, glands etc. shall be provided to complete the LDB/ WDB in all respects.

c) DC LDB (LDB-D)

Each LDB shall comprise of following and comply with enclosed Data Sheet A:

i. Incomer & Outgoing feeders shall be as per Datasheet-A.

ii. Two pole DC contactor on the incoming circuit for changeover to DC in case of AC normal supply failure.

iii. One under voltage relay of suitable range, if required.

iv. One ON delay timer.

v. One test push button.

vi. Set of bus bars for positive and negative.

vii. Two indicating lamps with fuses for indicating bus supply ON.

viii. Power & control terminals, earth-stud, earth busbar, designation labels, internal wiring, power cable lugs, glands etc. shall be provided to complete the LDB in all respects.

3.2 LIGHTING PANELS (LPs)

3.2.1 General Requirements of Lighting Panels

a) LPs shall be totally enclosed, suitable for electrical system data as specified in Data Sheet A. The LP shall be suitable for mounting on wall / column / structure.

b) Panels shall be suitable for indoor / outdoor application as per Data Sheet A.

c) All components of the LP shall be fully mounted inside the panel. LPs shall have only one operational front. Door shall be provided to give full access to all the components. Door shall have padlocking arrangement.

d) LPs shall consist of dust and vermin proof cubicles without the use of louvers.

e) Good quality synthetic rubber / neoprene gaskets shall be put around the door. The door when closed, shall compress the gasket uniformly.

f) The LPs shall be designed to prevent contact with live parts when the front door is open.

g) All busbars (phase, neutral, positive, negative as applicable) within a panel shall be of the same size.

h) All control wiring inside the panels shall be carried out with 1100 V grade, PVC insulated flexible copper wire of 2.5 sq. mm size.

i) The rated continuous current of the equipment and components shall be as given in Datasheet-A. These ratings shall be obtained with the components mounted in their housing as in service without exceeding the permissible temperature rise.

j) Each LP shall be fitted with M.S. mounting brackets.

k) Panel shall be suitable for top / bottom cable / conduit entries. However, outdoor LPs shall have bottom cable / conduit entry. Removable undrilled gland plate of sheet steel shall be provided for entry of cables. Minimum thickness of gland plate shall be as per Data Sheet-A. The gland plate shall be of adequate size having knock-outs for requisite number cable connections. Gland plate shall be provided with gasket.

l) The lighting panel shall be complete with copper busbars, and shall incorporate incomer and outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

m) Each lighting panel shall be fitted with two GI earth studs located in accessible position on the outside of the panel on opposite sides.

n) All metal parts of the panel except current carrying parts shall be bonded together electrically to the earthing stud.

o) Each panel shall be fitted with phase barriers of fireproof insulating material in such a manner that it is not readily possible for personnel to touch the phase busbars. Insulating sheet shall be fitted around the MCBs such that only the surface and toggle of the MCBs are available on the front.

p) The supply of cable lugs for power and control cable connections forms part of the supply of equipment.

q) Each panel shall be provided with a circuit directory plate with inscriptions neatly typed and laminated, fitted on the inside of door.

3.2.2 Type of Lighting Panels

a) LP-A (n) - AC Lighting Panel

b) LP-D (n) - DC Lighting Panel

c) LP-F (n) - Fancy Lighting Panel (Decorative)

d) LP-S (n) - Street Lighting Panel

NOTE: (n) indicates number of outgoing circuits.

3.2.3 AC Lighting Panel (LP-A)

a) LPs shall be provided with incomer and requisite number of outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

b) Separate neutral shall be available at terminal block for each outgoing circuit.

c) Construction of AC Normal and AC Emergency panels shall be same.

3.2.4 DC Lighting Panels (LP-D)

~~a)~~ LPs shall be provided with incomer and requisite number of outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

3.2.5 Decorative Type Lighting Panels (LP-A)

a) Decorative lighting panels shall be designed for use in areas like administrative building, service building, canteen, residential premises etc.

b) Thickness of sheet steel shall be as per manufacturer's practice.

c) LPs shall be of tone colour with elegant finish.

d) LPs shall be provided with incomer and requisite number of outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

e) LPs shall be suitable for either surface or flush mounting. Flush mounted panels shall have the collared door suitable for matching with the wall.

f) Lighting Panels may be provided with transparent acrylic cover for operation of MCBs.

g) LPs shall be provided with knockouts on the top, bottom and sides.

3.2.6 Street Lighting Panel (LP-S)

a) Street Lighting Panels shall be provided for feeding power supply to luminaires of street light poles, flood lighting poles, lighting masts, watch towers etc.

b) Each Street Lighting Panel shall comprise of the following :

i. One TPN door interlocked switch-fuse unit incomer. Interlock defeat feature shall also be provided.

ii. Three pole AC Contactor

iii. 0 - 24 hrs timer and/or photo-electric switch for automatic switching of contactor

iv. Three phase & neutral busbars

v. Single pole or three pole MCBs for each outgoing circuit as per Data Sheet A

vi. Two lamps for bus supply ON & OFF indications

vii. Complete wiring arrangement as per control scheme.

viii. Auto-Manual selector switch

ix. ON push button

x. OFF push button

c) Switching ON and switching OFF shall be through both 0 - 24 hrs timer and light sensor in automatic mode.

d) One number light sensor in weather proof enclosure having IP:55 degree of protection shall be supplied loose along with each SLP.

e) Internal power wiring shall be done with PVC insulated Cu wire of suitable size. All control wiring inside the panel shall be carried out with 1100 V grade, PVC insulated flexible copper wires.

f) Two nos. outgoing circuit in each panel shall be tapped before contactor for watch tower supply.

4.0 COMPONENTS OF LDB/WDB AND LIGHTING PANEL

4.1 MOULDED CASE CIRCUIT BREAKERS

a) Moulded case circuit breakers (MCCBs) shall be provided when called for in Data Sheet A for use in lieu of switch fuse. MCCB shall meet the requirements stipulated in Data Sheet A.

b) MCCBs in AC circuits shall be of single throw, air break, heavy duty type triple pole construction arranged for simultaneous three pole manual closing and opening and for automatic tripping at short circuit and overload. Neutral link shall be provided for LDB/ WDB without transformers.

c) Operating mechanism shall be quick make, quick break and trip free type.

d) The ON, OFF & TRIP positions of the MCCB shall be clearly indicated so as to be visible to the operator when mounted as in service. Operating handle shall be provided on front of the LDB/ WDB.

e) MCCBs shall be capable of withstanding the thermal stresses caused by overloads and short circuits. The maximum tripping time under short circuit shall not exceed 20 milli-seconds.

f) MCCB terminals shall be shrouded and designed to receive cable lugs for cable sizes relevant to circuit ratings.

g) Under voltage releases and other releases shall be provided as specified in data Sheet-A.

4.2 SWITCH-FUSE UNITS

a) These units shall preferably comprise of switches having integral fuses, called composite units. Alternatively, combination units of separate switch and fuse may also be acceptable.

b) These units shall be provided for general purpose i.e. incoming or outgoing units.

c) The units shall be of the air break air insulated type and designed to ensure safety to operating personnel.

d) Composite units shall have integral fuses i.e. fuse carrier with fuse link (fuse link forming the moving contact). The design shall ensure that the moving contact is not live when switch is open i.e. in OFF position, so as to facilitate removal of fuse.

e) The switch shall be capable making and carrying the system prospective fault current, but limited in magnitude and duration by the cut off characteristics of the largest HRC fuse link that may be fitted to that unit.

f) The fixed contact shall be so shrouded that maintenance of the unit can be carried out in safety with the busbars live.

g) Where one isolating switch is used as the incoming device, the incoming side fixed contacts shall be shrouded to ensure that maintenance can be carried out with the remote fuse and switch closed.

h) Composite switch-fuse or the combination of switch and fuse shall meet the requirements of its components as follows:

Isolating Switch

i. Switches shall be air-break, quick make, and quick break heavy duty type conforming to applicable standard.

ii. All switches shall have visible ON / OFF position indication and shall be padlockable in any (ON / OFF) position.

iii. Switches shall be door interlocked such that it shall not be possible to gain access to inside the unit unless the isolating switch is in OFF position.

iv. The switches shall be suitable for independent manual operation.

v. The switch contacts shall be of silver alloy or silver plated copper and springs of non-corrosive material.

vi. Inter-phase barriers shall be provided to prevent possibilities of phase to phase fault in the switch. The switch shall also be shrouded from all sides to prevent access to live parts on the switch after opening the unit door. The barriers and shrouding shall extend upto the height of switch to fully enclose both side terminals of the device. The arrangement shall permit easy maintenance.

High Rupturing Capacity (HRC) Fuses

i. The fuse serving as the short-circuit protective device in isolating fuse-switch units shall be of HRC cartridge, current limiting and plug-in non-deteriorating type.

ii. The fuse carriers shall be easily withdrawable for replacement of fuse. Insulated fuse pullers shall be provided where fuses are not mounted in insulating carriers to remove and replace fuses in live conditions.

iii. Fuses shall preferably be fitted with a device to indicate operation (i.e. when the fuse has blown).

iv. Live terminals of fuse bases shall be shrouded to prevent contact with personnel where fuse links are not mounted in carriers and are directly plugged into the fuse base. Inter-phase barriers extending throughout the length of the fuse base shall be provided to prevent inter-phase short circuit. They shall be shrouded from all sides to prevent accidental contact.

v. Fuse carriers and bases shall be of good quality moulded insulating material. Porcelain fuse bases and carriers will not be accepted.

vi. The rating and characteristics of fuse links shall be chosen appropriately for short circuit protection of circuits downstream.

4.3 MINIATURE CIRCUIT BREAKERS

a) The use of miniature circuit breakers (MCBs) combining thermal overload and magnetic short circuit protection shall be application for the outgoing circuits of Lighting Panels.

b) MCBs shall have suitable rating as specified in Data Sheet A.

c) MCBs shall be suitable for housing in the lighting panel and for connection of copper link bus bar at the incoming and copper lugs at the outgoing ends.

d) The terminals of MCB and ON/OFF positions shall be clearly and indelibly marked.

4.4 CURRENT TRANSFORMERS

a) CTs shall be air insulated having insulation class E or better, cast resin type and shall be capable to withstand the thermal and mechanical stresses resulting from maximum short circuit.

b) The short time current duration for CTs shall be one second.

c) CT primary current shall not be less than the full load thermal rating of the associated circuit. CT secondary current shall be as specified in Data Sheet A. Polarity shall be marked in a suitable manner. The ratings shall be adequate to cater for the burden of connected instruments.

d) CTs shall be of bar primary / wound primary / ring type capable of carrying the rated primary current.

4.5 VOLTAGE TRANSFORMER

a) Voltage transformers (VT) shall be dry, cast resin type comprising of single phase or three phase units. They shall have their primary windings protected by current limiting fuses with interrupting capacity corresponding to that of the lighting board / panel.

b) VT secondary windings shall be earthed in LDB/ WDB / LP through link, which can be removed for insulation testing.

c) Three phase voltage transformers shall be as per Data Sheet A.

Single phase VTs shall have voltage rating of (Nominal System Voltage / $\sqrt{3}$) V / (110 / $\sqrt{3}$) V so that secondary voltage shall be 110 volts phase to phase when the secondary winding is star connected.

d) VTs shall have an output rating adequate to cater to the burden connected to them.

4.6 INDICATING METERS

a) Meters shall be panel mounted, flush type and suitable for rear terminal connection.

b) Meters and instruments shall be enclosed in dust proof, moisture resistant black finished cases and shall be suitable for tropical use. Instruments shall be suitable for operation from the secondary windings of CTs and VTs.

c) All instruments shall be calibrated to enable direct reading of primary quantities. Instruments shall be adjusted and calibrated at manufacturer's works and shall have means of calibration, checking and zero adjustment at site.

d) All the divisions and the quantity to be measured shall be clearly marked. Instruments shall conform to applicable standard having black numerals and lettering on white anti-parallax dial with knife edge pointer. Indicating instruments shall be of moving iron type for AC and moving coil type for DC circuits.

e) Instruments having metallic cases shall be fitted with earthing terminals.

4.7 CONTACTORS

a) Contactors shall be of the air break type, electromagnetic type fitted with arc shields.

b) The operating coil shall be suitable for satisfactory operation in the range of 85% - 110% of nominal voltage specified under the Data Sheet A. The coil shall be tropicalized having insulation not less than class 'E'.

c) Electrically independent auxiliary contacts not less than 2NO + 2NC for interlocking and indication shall be fitted to individual power contactor.

d) All springs shall be made out of a corrosion proof material.

4.8 RELAYS

a) Relays shall be provided on the various circuits as per schemes. Relays shall be flush mounted on front of the board. Relay case shall be painted with dull black or egg shell black enamel and with back connected terminals. Metal cases and frames of relay shall be earthed.

b) All relays shall be of withdrawable type with built-in testing facilities, with provision for inspection, maintenance and replacement. Where built-in test facility is not provided for a particular relay, separate suitable test block shall be provided on the board for this purpose.

c) Relay performance shall not alter due to mechanical shock or vibration or external magnetic field which may be present at the place of mounting.

d) Each relay shall not have less than two independent pairs of contacts.

4.9 TIMERS

4.9.1 Time Switch

a) Time switch shall be suitable for automatic switching ON and OFF of street lighting / flood lighting circuits.

b) Time switch have 00 - 24 hrs clock base.

c) Time switch shall indicate actual time and shall permit accurate time setting.

d) Time switch shall be rugged, independent of normal fluctuations of voltage / frequency and free from maintenance.

e) Contact rating, clock accuracy, rated voltage rating and frequency rating of timer shall be suitable to its application.

f) Time switch shall be provided with Ni-Cd battery.

g) Time switch shall be suitable for mounting inside the panel.

4.9.2 On/Off Delay Timer

a) On delay timer shall be required for continuation of DC supply for a limited duration when the AC Emergency supply has been restored and DG set is under stabilisation.

b) Timer shall be fully static and suitable for operation on normal frequency and system voltage.

c) Timer shall have high setting accuracy, high repeat accuracy, low reset time and low power consumption.

d) Timer shall have the time setting range as mentioned in Data Sheet A.

e) Timer shall be suitable for mounting inside the panel.

4.10 SELECTOR SWITCHES

a) The rating and other features of the switches shall be suitable for the application. The number of positions and the number of contacts required for each switch shall be as indicated in the schemes

b) Selector switches shall be stay put type, provided with properly designated escutcheon plates clearly marked to show operating position.

c) Terminals carrying potential above 120 Volts shall be shrouded to prevent accidental contact with personnel.

d) Ammeter selector switches shall have make before break contacts.

e) The switches shall be suitable for semi-flush mounting with the front plate and operating handle projecting out. All connection to the switches shall be from the back.

f) The arrangement for front mounting of these devices shall be such as to make them reasonably dust free so as not to interfere with normal operation.

4.11 PUSH BUTTONS

a) Push button shall be heavy duty, flush mounted suitable for the application.

b) Push button shall be provided with integral escutcheon plates marked with its function identified as per schemes.

c) Colour shall be appropriate to the function.

d) Minimum number of contacts shall be 2 NO + 2 NC or as per the requirements of control scheme.

4.12 INDICATION LAMPS

a) Indication lamps shall be complete with lens covers and holders.

b) Each lamp shall be fitted with a durable resistance integrally wired in series with the lamp. Alternatively, lamps with built in transformers are acceptable.

c) The lamp cover (lens) shall be translucent of appropriate colour.

d) Bulbs and covers shall be interchangeable, easily replaceable from the front without the need for any special means.

e) Terminals having potential above 120V shall be shrouded to prevent contact with personnel.

f) Terminals shall be suitable for ring type copper cable lugs of size depending upon the circuit rating.

4.13 CABLE GLANDS

a) Whether specifically mentioned or not, cable glands of suitable sizes shall be supplied along with each equipment for power and control cables.

b) Rubber components used in the gland shall be of neoprene.

c) Name / trade name of manufacturer, type no. and applicable range of outer diameter of cable shall be engraved / indelibly printed on the cable gland.

4.14 CABLE LUGS

a) All equipment shall be supplied with the power and control cable lugs of suitable size, whether specifically mentioned or not.

b) Name / trade name and size of lug shall be engraved/ indelibly printed on each cable lug.

4.15 TERMINALS

a) Terminals shall be stud type of copper material.

b) Terminals shall be provided with transparent cover(s).

c) Separate terminals shall be available for each termination of loop-in and loop-out power connections.

5.0 LABELING

5.1 Labels to identify all the Main assemblies, Sub-assemblies and components of the LDB/ WDB and LPs shall be provided.

5.2 Name and rating plate / marking shall be provided as required by relevant standard applicable to each component / assembly to be identified.

5.3 Labels shall be of two colour, three layer plastic material with matt or semi matt finish or of the anodised aluminium sheet.

5.4 All labels other than “Danger” or “Warning” labels shall have black lettering on a white background. Danger labels shall be as per applicable standard and shall not be affixed on to removable parts.

5.5 All labels shall be securely fixed on to the equipment by means of self tapping screws or other approved means.

5.6 Stick-on type labels of good quality and permanent mounting shall be acceptable for internally mounted components only.

5.7 A list of all such items to be labeled and text and type of labels to be provided is given below:

a) BOARD DESIGNATION (MAIN EQUIPMENT LABEL)

i. **Inscription** :
Designation & LDB/ WDB number for LDB/ WDB.
Designation and LP number for LPs.

ii. **Location** :
Top centre in the front of the LDB/ WDB.
Top centre in the front of the LP.

iii. **Material** :
3 Layer plastic material, fixation by self tapping, non-rusting screws, black inscription on white back ground.

b) OUTGOING - FEEDER DESIGNATION

i. **Inscription** : Module number, LP number / purpose.

ii. **Material** :
Black engraving on white anodised aluminium plate of thickness 1.6 mm or more. Plate to be secured with screws.

c) COMPONENT DESIGNATION

i. **Inscription** : Letter symbol / Legend as assigned in schemes.

ii. **Location** : Near or on the component

iii. **Material** : Stick-on type

5.8 CIRCUIT DIAGRAM / DIRECTORY PLATE

a) A diagram is to be prepared for fixing to the inside cover of every lighting panel giving details of the points controlled by each circuit.

b) The circuit list shall be typed or printed stating the location of the equipment served, rating of the protective unit and the circuit loadings.

c) The list shall be mounted on the inside of the cover door and shall be protected by an acrylic sheet cover to be easily removable to permit circuit modifications.

6.0 SURFACE TREATMENT

6.1 All metal parts and the surfaces (exterior & interior) of equipment, unless stated otherwise in case of reflectors, shall be degreased by dipping in hot alkaline solution and rubbed with wire brush to remove oil & scale from them & then rinsed in water. Alternatively, they may be shot / sand blasted.

6.2 Parts shall be pickled by dipping in hydrochloric acid tank to remove the rust from the surfaces formed during storage of sheets & then rinsed to remove traces of the acid. The cleaning and pretreatment of all metal parts shall be as per applicable standard.

6.3 The surfaces to be painted shall then be prepared by phosphatizing to protect them from further rusting & to create a good bond with the paint. The pretreatment shall conform to the applicable standard.

6.4 All parts shall then be subjected to a coat of red oxide primer paint.

6.5 All inside and outside surfaces of panel shall be spray painted with synthetic enamel of the shade and minimum thickness as per Data Sheet A.

6.6 Electrostatic or powder painting shall be acceptable subject to purchaser’s approval.

6.7 Wherever possible, finished parts shall be coated with peelable compound by spraying method to protect the finished product from scratches, grease, dirty and oily spots during handling and transportation.

7.0 PACKING

7.1 Packing procedure shall conform to the following :

a) The equipment shall be properly packed before dispatch. The packing shall prevent damage to the contents while handling and lengthy period of outdoor storage.

b) The equipment shall be wrapped in weather proof packing using polythene sheets/ air bubble sheets/ thermocol sheets and then secured in wooden packing cases. Wood for wooden packing cases/ crates shall be chemically treated to prevent deterioration due to fungi and attack by termites, borers, and any other kind of infection.

c) The equipment shall be secured by fixing base plate/ frame with the help of bolt and nuts etc. to bottom frame of the wooden packing cases/ crates. Suitable cushioning material like rubberised coir (min. 50 mm thick & 100 mm wide) shall be provided on the bottom support. Gap between the panel and casing shall be filled with rubberised coir with distance between consecutive supports less than 500mm.

7.2 Specification for the sea worthy packing, if enclosed, for the export jobs shall form part of the specification.

8.0 INSPECTION & TESTING

8.1 Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-558-E005) without any deviations. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ ultimate customer's approval. There shall be no commercial implication to BHEL on account of any changes in QP during contract stage.

8.2 All the components and completely assembled equipment shall be tested as per the latest edition of standards. Charges for these tests shall be deemed to be included in equipment price.

8.3 All the specified type and routine tests shall be carried out to verify the rating and performance of the equipment. Where valid type test certificates in evidence of equipment performance claimed are available & approved by purchaser, the requirements for conducting type tests may be waived. The general arrangement of object under test shall be to purchaser's approval.

8.4 Functional testing shall be carried out for Lighting/Welding Distribution Boards/ Lighting Panels.

8.5 All manufacturing processes viz. machining, sheet forming, electroplating, wire routing, cleating & crimping, assembly, surface preparation shall conform to good manufacturing practices.

8.6 Inspection for dimensional & visual checks especially of the following, with respect to contract drawings, documents & standards shall be conducted:

a) General sturdiness & rigidity of equipment.
b) Surface finishing.
c) Gasketting.
d) Inter-changeability.
e) Constructional features viz. location, accessibility & marking of components, segregation, accessibility to live parts (shrouding) etc.
f) Completeness of scope.

8.7 Safety interlocking verification shall be done.

8.8 Each lighting transformer shall be routine tested and one transformer of each rating shall be type tested in accordance with relevant standard in case type test certificates of similar transformers are not available / not acceptable to the purchaser.

8.9 Equipment shall be liable for rejection if tolerances on the values of dimensions, power consumption, impedances, temperature rise etc. exceed the specified values by purchaser and / or standards.

9.0 TOOLS AND TACKLE

9.1 Tools & tackle which are essential to facilitate assembly, adjustments, erection, maintenance & dismantling of equipment shall be provided as part of equipment supplied.

9.2 The above tools shall be supplied along with the initial consignment of equipment so as to be available prior to erection but may not be used for erection purposes.

9.3 Vendor shall also submit a list of recommended tools and tackle. Acceptance of these tools and tackle shall not be a binding on the purchaser.

9.4 Schedule of tools & tackle shall be filled up by bidder.

10.0 SPARES

10.1 Mandatory spares (if applicable) are indicated in BOQ-cum-price schedule.

10.2 Erection & commissioning spares are included in the bidder's scope of supply. Bidder to furnish list of E&C spares in the relevant schedules of the Bid Form and Price Schedules.

	ITEM : (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.): LIGHTING PANEL & LIGHTING DISTRIBUTION BOARDS	STANDARD QUALITY PLAN	Q.P. No. : 0000-999-QOE-S-034 REV. : 0 1 DTD: 15/03/04 PAGE 1 OF 3 VALID UPTO :14.03.07	REVIEWED BY S.D .SINGH O.P.NIRANJAN I. J. SINGH	APPROVED BY ANIL GUPTA

SL. NO.	COMPONENT & OPERATIONS	CHARACTERSTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M	QUANTUM OF CHECK C / N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6		7	8	9		** 10			11
1	Lighting Panels & Lighting Distribution Boards **Final Inspection and Testing**	a) Overal Dimensions	MA	Meas.	100%	One Panel/ Type/lot	NTPC/Main supplier Appd. Drg / data sheet	NTPC/Main supplier Appd. Drg / data sheet	Inspt. Report		P	W	W	
		b) Thickness of sheet	MA	Meas.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		c) Paint shade	MA	Visual	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		d)Thickness of paint	MA	Meas	100% of items	Min. 5 points/ Panel	--DO--	--DO--	--DO--		P	W	W	
		e) Surface finish	MA	Visual	100%	--D0--	Smooth, without lump	Smooth, without lump	--DO--		P	W	W	
		f) Adhesion Test	MA	Mech.	One sample/ lot/size	One sample lot	Should not peel off	Should not peel off	--DO--		P	W	W	
		g) Name Plate	MA	Visual	100%	10% of each type	NTPC/Main supllier Appd drg/ data sheet	NTPC/Main supplier Appd drg/ data sheet	--DO--		P	W	W	
		h) Tightness of bus bar bolts	MA	Mech	100%	One Panel/ Type/lot	Manufacturer Std.	Manufacturer Std.	--DO-		P	W	W	
		i) Bus Bar Clearance	MA	Meas.	100%	--DO--	NTPC/Main supplier Appd drg /data sheet	NTPC/Main supplier Appd drg /data sheet	--DO--		P	W	W	

LEGEND: RECORDS IDENTIFIED IDENTIFIED WITH **"TICK"** SHALL BE ESSENTIALLY INCLUDED BY THE CONTRACTOR IN QA DOCUMENTATION

** M: MANUFACTURER/SUB-SUPPLIER, C:CONTRACTOR/NOMINATED INSPECTION AGENCY(SUBJECT TO PRIOR APPROVAL OF NTPC). N: NTPC. INDICATE **"P"** PERFORM **"W"** WITNESS AND **"V"** VERIFICATION AS APPROPRIATE

"CHP" BY NTPC SHALL BE IDENTIFIED IN COLUMN **"N"** AS **"W"**.

	ITEM : (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.): LIGHTING PANEL & LIGHTING DISTRIBUTION BOARDS	STANDARD QUALITY PLAN	Q.P. No. : 0000-999-QOE-S-034 REV. : 0 1 DTD: 15/03/04 PAGE 2 OF 3 VALID UPTO :14.03.07	REVIEWED BY S.D .SINGH O.P.NIRANJAN I . J. SINGH	APPROVED BY ANIL GUPTA APPROVED N.T.P.C. NOIDA

SL. NO.	COMPONENT & OPERATIONS	CHARACTERSTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M	QUANTUM OF CHECK C / N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6		7	8	9		**	10		11
		j) GA& Bill of material	CR	Phy.	100%	10% of each type	--DO--	--DO--	--D0--		P	W	W	
		k) Identification of Component lay out	MA	Visual	100%	One Panel/ type/lot	--DO--	--DO--	--DO--		P	W	W	
		l) Completeness of												
		i) Wiring	MA	Elect.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		ii) Ferruling	MA	Visual	100%	--DO--	--DO--	--D0--	--DO--		P	W	W	
		m) Size of wires	MA	Meas.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		n) Colour coding of bus bar	MA	Visual	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		o) Spare terminals	MA	Meas.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		p) Shrouding of live parts	MA	Visual	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		q) Door earthing	MA	Megger	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		r) Functional Tests including HV, IR & continuity	CR	Elec.	100%	10%	--DO--	--DO--	--DO--		P	W	W	
		s) Degree of protection (Paper insertion method)	CR	Phy.	100%	One Panel/ type/lot	NTPC/Main supplier Appd drg./data sheet	NTPC/Main supplier Appd drg./data sheet	--DO--		P	W	W	

LEGEND: RECORDS IDENTIFIED IDENTIFIED WITH **"TICK"** SHALL BE ESSENTIALLY INCLUDED BY THE CONTRACTOR IN QA DOCUMENTATION

** M: MANUFACTURER/SUB-SUPPLIER, C:CONTRACTOR/NOMINATED INSPECTION AGENCY(SUBJECT TO PRIOR APPROVAL OF NTPC). N: NTPC. INDICATE **"P"** PERFORM **"W"** WITNESS AND **"V"** VERIFICATION AS APPROPRIATE

"CHP" BY NTPC SHALL BE IDENTIFIED IN COLUMN **"N"** AS **"W"**.

	ITEM : (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.):	STANDARD QUALITY PLAN	Q.P. No. : 0000-999-QOE-S-034	REVIEWED BY	APPROVED BY
एनटीपीसी NTPC	LIGHTING PANEL & LIGHTING DISTRIBUTION BOARDS		REV. : 0 1 DTD: 15/03/04 PAGE 3 OF 3 VALID UPTO :14.03.07	S.D .SINGH O.P.NIRANJAN I. J. SINGH	ANIL GUPTA

ANNEXURE 1 TO SQP NO. 0000 - 999 - QOE - S - 034 REV 01

Sl. No	Item	Make	NOTE : Makes of major BOIs will be subject to NTPC approval / acceptance
1	Indicating Meters		
2	Indicating lamp		
3	Current Transformer		
4	Potential Transformer		
5	Dry Type Transformer		
6	Timer		
7	MCB		
8	On-Off Switch		
9	Fuse		
10	Push Button		
11	Contactor		
12	Terminal Block		
13	Wires		

LEGEND: RECORDS IDENTIFIED IDENTIFIED WITH **"TICK"** SHALL BE ESSENTIALLY *INCLUDED BY THE* CONTRACTOR IN QA DOCUMENTATION

** M: MANUFACTURER/SUB-SUPPLIER, C:CONTRACTOR/NOMINATED INSPECTION AGENCY.(SUBJECT TO PRIOR APPROVAL OF NTPC) N: NTPC. INDICATE *"P" PERFORM* **"W"** WITNESS AND **"V"**

"CHP" BY NTPC SHALL BE IDENTIFIED IN COLUMN **"N"** AS **"W"**.

CIN No. U99999MH1970GAPO14629

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Cir. No.: 09/DIV/LVSWGR/05 **February 20, 2019**

To All members of LV Switchgear and MV+HV Switchgear Division
To all State Electricity Boards, Utilities and Other purchasing organizations

Sub: Final Price variation clauses for

1. LV Switchgear and Controlgear
2. MV AIS (Up to & Including 36 KV) Switchgear and Controlgear

IEEMA LV Switchgear and MV+HV Switchgear division has decided to revise old Price Variation clause applicable for LV and MV Switchgear (effective from January 2002) with change in cost composition and changes the sources for few raw materials which are currently in vogue.

IEEMA had circulated a Draft PV clause for LV and MV Switchgear vide cir. No. **02/DIV/LVSWGR/05** dated **January 17, 2019**. After incorporating suggestions on the above; we are making it final and operational from 1st January 2019.

We enclose separate revised PV clauses (effective from January 2019) for LV Switchgear (up to 1100 V) and MV Switchgear (above 1100V up to 36 kV) along with sample two-step calculation. Monthly PV circulars of January 2019 as per old and new PV clauses are being published separately.

We request and recommend all the users & stakeholders including Utilities, PSUs etc. to incorporate these revised PV formula in all the new tenders/contracts.

For pending contracts, for the date of delivery on or after 1st April 2019, to arrive at the final price variation, we recommend using the following two stage method, which is a standard institutionalized methodology adopted by IEEMA for change over in all IEEMA PV clauses.

1. Calculate price variation 'P' from applicable prices/indices as per your base date / date of tendering up to January 2019 i.e. considering all prices/indices published in PV circular of January 2019 at numerator place; using IEEMA PV clause effective from January 2002.

2. Treat the above calculated 'P' as 'P_0' and calculate final price variation considering all prices / indices published in January 2019 as base prices/indices (at the denominator place) up to the applicable prices/indices as per your date of delivery; using revised LV / MV Switchgear clause effective from 1st January 2019.

A two-step sample calculation is given as annexure.

Senior Director

Annexure to cir no 09/DIV/LVSWGR/05 dated February 20, 2019

Price variation formula for LV SWITCHGEAR AND CONTROLGEAR up to & including 1100 V

		Date of Tendering	Apr-18	Date of Delivery	Apr-19		
Step I				**Step II**			
IEEMA SWGR PVC effective from 1st January 2002				IEEMA LV SWGR PVC effective from 1st January 2019			
% Weightages	Raw Material	Applicable month as per Date of Tendering (Apr-18)	Applicable month as per Date of of Delivery (FIXED)*	% Weightages	Raw Material	Applicable month as per Date of Tendering (FIXED)#	Applicable month as per Date of of Delivery (Apr-19)
25	Fix cost			21	Fix cost		
17	IS	Jan-18	Nov-18	19	IS	Nov-18	Dec-18
18	C (Copper Bar)	Mar-18	Jan-19	21	C (LME Copper)	Jan-19	Feb-19
10	AL	Mar-18	Jan-19	12	AL	Jan-19	Feb-19
13	In	Mar-18	Jan-19	15	In (Phenolic Moulding Powder)	Jan-19	Feb-19
17	W	Dec-17	Oct-18	12	W	Oct-18	Nov-18

Price variation formula for MV AIS (Above 1100 V and Up to & Including 36 KV) for outdoor circuit breakers and switchgear

		Date of Tendering	Apr-18	Date of Delivery	Apr-19		
Step I				**Step II**			
IEEMA SWGR PVC effective from 1st January 2002				IEEMA MV SWGR PVC effective from 1st January 2019			
Weightages	Raw Material	Applicable month as per Date of Tendering (Apr-18)	Applicable month as per Date of of Delivery (FIXED)*	Weightages	Raw Material	Applicable month as per Date of Tendering (FIXED)#	Applicable month as per Date of of Delivery (Apr-19)
25	Fix cost			20	Fix cost		
17	IS	Jan-18	Nov-18	28	IS	Nov-18	Dec-18
18	C (Copper Bar)	Mar-18	Jan-19	26	C (LME Copper)	Jan-19	Feb-19
10	AL	Mar-18	Jan-19	4	AL	Jan-19	Feb-19
13	In (Epoxy Resin)	Mar-18	Jan-19	9	In (WPI of Insulator)	Nov-18	Dec-18
17	W	Dec-17	Oct-18	13	W	Oct-18	Nov-18

In step I calculation,

* all prices/indices to be taken from circular ref IEEMA(PVC)SWGR/(R)/01/2019 for applicable month as per old PV formulae wef Jan 2002

In step II calculation,

all prices/indices to be taken from circular ref IEEMA(PVC)SWGR(R-1)/01/2019 for applicable month as per new PV formulae wef Jan 2019

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IEEMA/PVC/LVSWGR/2019 (R-2) **Effective from: 1st January 2019**

PRICE VARIATION CLAUSE FOR LV SWITCHGEAR AND CONTROLGEAR (up to & including 1100 V)

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P0}{100}\left(21 + 19\,\frac{IS}{IS0} + 21\,\frac{C}{C0} + 12\,\frac{AL}{AL0} + 15\,\frac{In}{In0} + 12\,\frac{W}{W0}\right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P_0 = Price quoted/confirmed. (Exclusive of all taxes & duties)

IS_0 = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12=100)(refer notes)
This index number is as applicable for the month, **THREE** month prior to the date of tendering.

C_0 = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

Al_0 = Price of busbar grade aluminium (refer notes).
This price is as applicable on the 1st working day of the month, **ONE** month prior to the date of tendering

In_0 = Price of phenolic moulding powder
This price is as applicable on the 1st working day of the month, **ONE** month prior to the date of tendering.

W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100)
This index number is as applicable for the month, **Four** months prior to the date of tendering.

For example, if date of tendering falls in April 2019, applicable prices of Copper (C_0), Aluminium Busbar (Al_0) and Insulating Material (In_0) should be as on 1st March 2019 and Wholesale price index number for 'Manufacture of Basic Metals' (IS_0) and all India average consumer price index no. (W_0) should be for the month of January 2019.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/SWGR(R-1)/_/_ **ONE** month prior to the date of tendering.

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IS = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12=100) (refer notes)
This index number is as applicable for the month, **FOUR** month prior to the date of delivery.

C = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, **TWO** month prior to the date of delivery.

Al = Price of busbar grade aluminium (refer notes).
This price is as applicable on the 1st working day of the month, **TWO** month prior to the date of delivery.

In = Price of phenolic moulding powder
This price is as applicable on the 1st working day of the month, **TWO** month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100)
This index number is as applicable for the month, **FIVE** months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in June 2019, applicable prices of Copper (C_0), Aluminium Busbar (Al_0) and Insulating Material (In_0) should be as on 1st April 2019 and Wholesale price index number for 'Manufacture of Basic Metals' (S_0) and all India average consumer price index no. (W_0) should be for the month of February 2019.

The date of delivery is the date on which the product is notified as being ready for inspection/despatch (in the absence of such notification, the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes

a) All prices of raw materials are exclusive of modvatable GST/CV duty amount and exclusive of any other central, state or local taxes, octroi etc.

b) The details of prices are as under:

1. The wholesale price index number for 'Manufacture of Basic Metals' is as published by the Office of Economic Advisor, Ministry of commerce & Industry, Govt. of India, New Delhi with base 2011-12 = 100

2. The LME price of Copper Wire Bars (in Rs./MT) is the LME average settlement price of Copper Wire Bars converted into Indian Rupees with applicable average exchange rate of SBI of the month. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty

3. The price of busbar grade aluminium (in Rs/MT) is the average of ex-works price as quoted by the two primary producers for the busbar size 152.4 x 6.35 mm flat approximately, grade equivalent to E91 E as per IS 5082-1998 (or the latest).

4. The price of insulating material (in Rs/Kg) is the average price of phenolic moulding powder quoted by three manufacturers applicable for Switchgear and Controlgear of medium/lower voltage up to 1100 volts

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IEEMA/PVC/DIST_DT_CU/2021 Effective from: 01 September 2021

PRICE VARIATION CLAUSE FOR COPPER WOUND DRY TYPE DISTRIBUTION TRANSFORMERS COMPLETE WITH ALL ACCESSORIES AND COMPONENTS (Of ratings up to and including 2,500 KVA and voltage class up to 33 KV) supplied against domestic contracts

This price variation clause is applicable for 'Copper Wound Dry Type Distribution Transformers', with rating up to and including 2,500 KVA and voltage class up to 33 KV supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST_DT_CU/DE/2021 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_o}{100}\left(7 + 35\,\frac{C}{C_o} + 30\,\frac{ES}{ES_o} + 7\,\frac{IS}{IS_o} + 8\,\frac{IM}{IM_o} + 7\,\frac{ER}{ER_o} + 6\,\frac{W}{W_o}\right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P_0 = Price quoted/confirmed.

C_0 = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

ES_o = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

IS_o = Price of HR Coil of 3.15 mm thickness (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

IM_0 = Price of Insulating Materials (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

ER_0 = Price of Epoxy resin (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

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W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Copper (C_0), Epoxy Resin (ER_0), CRGO Steel Sheets (ES_0), HR Coil (IS_0) and Insulating material (IM_0) should be as on 1st November 2021 and all India average consumer price index no. (W_0) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/_ **ONE** month prior to the date of tendering.

C = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

ES = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

IS = Price of HR Coil of 3.15 mm thickness (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

IM = Price of Insulating Materials (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

ER = Price of Epoxy resin (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Copper (C), Epoxy Resin (ER), CRGO Steel Sheets (ES), HR Coil (IS) and Insulating material (IM) should be as on 1st November 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/_ **ONE** month prior to the date of delivery.

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The date of delivery is the date on which the transformer is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes: (a) All prices of raw materials are exclusive of GST amount and exclusive of any other central, state or local taxes etc..

a) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier

b) The details of prices are as under:

1. Price of 8 mm CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.

2. The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers

3. Price of steel is the average retail price of HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT

4. The average price of Insulting materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.

5. The price of Epoxy resin is price quoted by resin manufacturer for their grade CT 5900 or its nearest equivalent.

Director

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Buyer Specific-ATC -Lighting Distribution Board PARICCHA ESP R&M Project

TABLE OF CONTENTS

INTRODUCTION

1. This is a Buyer specific document named Additional Terms & Conditions (ATC). This document is applicable for the enquiry issued on Government e-Marketplace (GeM) portal. These terms and conditions must be read in conjunction with GeM-General Terms & Conditions (GTC).

2. In case of any conflict, terms and conditions stipulated in ATC shall supersede those in GTC on GeM.

INSTRUCTIONS TO THE SUPPLIERS

Suppliers are advised to note the following instructions regarding Bid/Offer submission: -

1. To regularly visit GeM portal to access the tender documents and latest updates about the tender.

2. To study all the tender documents carefully. Any submission of tender by the Supplier shall be deemed to have been done after careful study & examination of the tender documents and with full understanding of the implications thereof. Non-compliance with any of the requirements and instructions in the Tender Enquiry shall be treated as an Incomplete Bid/Offer. Suppliers would be liable for actions as per extant policies/guidelines, if they fail to abide by any of the Policies including the terms and conditions stipulated in this document.

3. Ensure submission of their Bid/Offer on or before the latest due date and time indicated in the tender after taking cognizance of all the tender documents including corrigenda (if any) published against this tender.

4. To submit their Bids/Offers on GeM portal only.

5. Not to send copy of Bid/Offer through any other mode i.e. hard copy and or through email etc. In case Bids/Offers are received through any other mode other than GeM portal from any of the Suppliers against this tender, the same shall be ignored.

6. Incomplete Bid/Offer shall be rejected by giving a suitable cut-off date.

ORDER OF PRECEDENCE

In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following order of precedence:

i. Amendments to Order/ Contract Purchase Order
ii. Order/ Contract Purchase Order
iii. Letter of Intent (LOI)/ Letter of Award (LOA)
iv. Clarifications agreed between Buyer and Supplier in regards to the tender or the bidding conditions
v. Corrigenda to NIT, with those of later date having precedence over those of earlier date
vi. Enquiry letter and annexures except documents listed in point no (vii) to (x) below.
vii. Technical Specifications
viii. Additional Terms & Conditions (ATC)
ix. Special Conditions of Contract (SCC)
x. GeM General Terms & Conditions (GTC)

DEFINITION OF TERMS

Throughout the Tender Documents including the Enquiry Letter, the following words shall have the meanings assigned to them herein, unless the subject matter or the context requires otherwise: -

1 **Owner** shall mean the **Customer** or **Client** for whose project the enquiry is issued by Buyer and shall include its successors and assignees as well as authorized officer(s)/ representative(s).

2 **Sub-Supplier** shall mean the person/ firm/ company/ organization to whom any part of the work has been sub-contracted by Seller/Supplier, with the written consent of Buyer, and shall include sub-Contractor's heirs, executors, administrators, representatives and assignees as agreed between Seller/Supplier and Buyer (BHEL).

Note - The Term Supplier is used for Seller/ Bidder/ Vendor/Manufacturer in this document. The term Sub-Supplier is used for Sub-Contractor/ Sub-Vendor in this document.

3 **Site** shall mean and include the land and place on which the project station related facilities are to be constructed and any adjacent land which may be allocated or used by *Owner, Buyer or Supplier* in performance of the Order/ Contract.

4 **Erection** shall mean include all work required for complete installation, from receiving, unloading, storage, preservation, to fixing & securing the equipment in its space.

5 **Commissioning** shall mean successful/ satisfactory completion of Trial Operation and readiness of the contracted/ ordered package / plant and materials unit wise/ set wise/ individual sub-system etc. including associated stand by for commercial use. This will include all consumables and inputs required for pre-commissioning.

6 **Inspection Agency (IA)** shall mean person(s) authorized by Buyer / Owner to inspect the stores as per Order/ Contract at Supplier's / Sub-Supplier's works. Suppliers to raise inspection call on BHEL - Quality Surveillance System (https://cqir.bhel.in).

7 **Month** shall mean calendar month and **Week** shall mean 7 days.

8 **Services** shall include Engineering, Study, Calibration, Type Test, Supervision of Erection and/or Commissioning, Installation Check, PG Test, Demonstration, Operation & Maintenance (O&M), Annual Maintenance of Contract (AMC), etc.

9 **Performance Guarantee Test** shall mean a test to be conducted by the Supplier at Site and witnessed by Owner/ Buyer, as per procedure submitted by the Supplier and approved by Owner/ Buyer describing the objective of the test, detailed procedures to test the guaranteed parameters, obligations as per the order/ contract, results presentation procedure and verification & acceptance criterion.

TERMS & CONDITIONS

1	**BID SECURITY/ EARNEST MONEY DEPOSIT (EMD)- Not applicable**
2	**PART-II BID OPENING IS SUBJECT TO FOLLOWING CONDITIONS:**
	i) Qualification of Technical PQR. ii) Techno-commercial compliance to the NIT (Bid). iii) Mandatory conformance to applicable Govt. of India rules/ guidelines/ notifications/ circulars as issued or amended time to time. iv) **For Parichaa R &M** -Approval of bidder by End Customer (UPRVUNL)- "Bidders those are not approved by End Customer, credentials (incl. past experience and performance) to be submitted by bidders for approval from end customer alongwith their offer".
3	**REGISTRATION IN BHEL-PEM**
	It is strongly recommended that suppliers get themselves registered in BHEL-PEM as a "Regular Supplier". Regular Suppliers for the package are informed about the floated tender enquiries by BHEL-PEM. Suppliers to apply online through registration portal available at www.pem.bhel.com - Vendor Section - Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration can be uploaded & submitted online through the website.
4	**TECHNICAL PQR**
	Applicable **i)** Supplier has to provide the details as per TECHNICAL PQR in its Offer. Supplier to note that bids of only those Supplier(s) shall be evaluated who meet the Pre-Qualifying requirements. **ii)** This item/package /system falls under the list of items defined in para 3 of ministry of finance guideline dated 20.09.16 (Procurement of items related to Public safety, Health, Critical Security operations & Equipment's etc.) & hence criteria of prior experience/Turnover shall be same for all the Suppliers including Start-up/MSME.
5	**FINANCIAL PQR**
	Not Applicable
5A	Above terms of BHEL PQR(s) shall prevail in conflict (if any).
6	**INTEGRITY PACT (IP)**
6.1	**Not Applicable**
7	**PQR DOCUMENTS VERIFICATION**

Suppliers to ensure that Third party / Customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document / certificate issuing authority in the format given below. Suppliers to furnish latest verification details for checking veracity of document(s) by the Buyer. In case the same is found not available, Buyer has right to reject such document(s) from evaluation: -

Sl. No.	Project Name	Customer Name, Contact Address, Phone No. & Email ID	Contract/ Order No.	Value of Contract/ Order	Brief of Work	Completion Date

8 CONFLICT OF INTEREST

A Supplier shall not have conflict of interest with other Suppliers. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. **The Supplier found to have a conflict of interest shall be disqualified.** A Supplier may be considered to have a conflict of interest with one or more parties in this bidding process, if:

a) they have controlling partner (s) in common; **or**
b) they receive **or** have received any direct or indirect subsidy/ financial stake from any of them; **or**
c) they have the same legal representative/agent for purposes of this bid; **or**
d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Supplier, **or**
e) Supplier participates in more than one bid in this bidding process. Participation by a Supplier in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from. one bidding manufacturer in more than one bid; **or**
f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
f.i. The principal manufacturer directly or through one Indian agent on his behalf; and
f.ii. Indian/foreign agent on behalf of only one principal,

or

g) A Supplier or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid,

or

h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Suppliers must proactively declare such sister/ common business/ management units in same/ similar line of business.

09 LIMIT FOR SUPERVISION OF E&C CHARGES- Not applicable

Supervision of E&C charges, if applicable, should not exceed 2% of the Total Contract Value (including Main Supply, E&C, Mandatory Spares, etc.) excluding freight & GST, failing which the quoted amount shall be adjusted (2% of the total contract value) by Buyer at the time of ordering. Payment shall be made as per the adjusted amount.

10	**DETAILED PRICE BREAK-UP**
	Suppliers to mention freight/GST percentage for all the items as part of un-priced bid to be submitted along with their Techno-Commercial offer. Detailed Price Break-up shall be submitted by Supplier within Three (03) working days of Reverse Auction. If Price Break-up is not furnished within 03 working days, Buyer shall proceed ahead with its Price Break-up, which shall be binding on the Supplier.
11	**PRICES**
	Prices shall be with PVC for the entire scope of work in line with the PVC formula as per tender documents and subsequent clarifications / confirmations till completion of Order / Contract. PVC shall be applicable within the contractual delivery period (including any delivery extension thereto). PVC shall be applicable (**https://ieema.org/wp-content/uploads/2020/07/lvswgr-jan-2019.pdf**) with upper ceiling limit of 20% & no negative ceiling limit for all items except Transformer. For Transformer, PVC shall be applicable (**https://ieema.org/wp-content/uploads/2020/07/Dist-TRF_Revised_2021.pdf)** with upper ceiling limit of 20% & no negative ceiling limit. Price variation shall be limited to +20% and no limit on -ve price variation.
12	**DELIVERY SCHEDULE & CONTRACT VALIDITY**
12.1	**1. Delivery Schedule** **a) Main Supply:** Delivery completion for Main supply shall be 195 days from the PO date. **b) Mandatory Spares: -** 90 days from BHEL clearance. **2.**Supplier to start manufacturing/supply only after getting the applicable engineering Drgs. /docs approved from Buyer/ Owner. **Drawings /documents submission/re-submission schedule** shall be as indicated in technical specification which shall be used for progress monitoring purpose and required course correction, if any. **3.**The delivery date specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule. The delivery conditions specified are for contractual purposes. However, to meet project requirement, the Buyer may ask for early deliveries without any compensation thereof.
11.2	**1. Validity of Contract (PO rates, terms and conditions):** Supplier has to make supply of goods/services as per the delivery time mentioned above. However, due to unavoidable circumstances where there is delay in providing inputs/ clearances from the Buyer (inputs, engineering approvals, deputing inspector for inspection, issuance of MDCC and/or any hold put by the Buyer for whatever reasons during execution of contract etc.) delivery time extension is admissible as per point no.3 below. In such situation it shall be obligatory on part of the Supplier to execute the contract at PO rates, terms and conditions provided inputs/ clearances have been accorded within validity of contract. Validity period for various activities shall be as defined below: - **1.1 Validity of the contract for main supply including quantity variation:** Contract shall be valid for **285 days** from the PO date. However, delay at Supplier's end (if any) shall be added to the validity period and contract validity shall get extended by the delay period at Supplier's end.

	For example: Original Delivery period for main supply: A (in days) Delay at Supplier's end: B (in days beyond "A" days) Contract validity: C+B (in days) Supplier to note that B is the Supplier delay days beyond original contractual delivery period for main supply /extended delivery period owing to time taken by BHEL. **2.** Main supply including quantity variation, mandatory spares/ services applicable in the contract released/ cleared for manufacturing within contractual validity period, to be supplied by Supplier at PO rates, terms and conditions. **3.** Execution of the contract quantities released beyond contract validity period shall be decided on mutual consent basis at PO rates, terms and conditions.
13	**TERMS OF DELIVERY AND INSURANCE**
	12.1 Terms of delivery shall be F.O.R. dispatch station. All dispatches shall be through Road Carriers on Freight Pre-Paid basis. E-way Bill will be arranged by Supplier as per GST law. 12.2 Unloading of items at delivery point shall be in the scope of Buyer. 12.3 Transit Insurance shall be in the Supplier's account.
14	**DOCUMENTS FOR DISPATCH**
	Supplier to submit copy of following documents by e-mail immediately on dispatch: i) Tax Invoice/ e-Invoice (as applicable), ii) LR, iii) Packing List, iv) Insurance Intimation, v) E-way bill (as applicable), vi) Copy of BHEL MDCC
15	**PAYMENT TERMS**
	15.1 Payment of Main Supply including Mandatory Spares (if any): 100% Payment shall be released against Consignee Receipt-cum-Acceptance Certificate (CRAC)/MRC (Material Receipt Certificate) on submission of bills. **15.2 Payment of Service(s) Charges:** 100% payment shall be released after successful completion of the activity on pro rata basis against CRAC/ certification by Buyer's Site or Engineering (as applicable) on submission of bills. **15.3 Documents for Payment:** **a) <u>For Supply including Mandatory Spares (if any)</u>:** i) Original Tax Invoice/e-Invoice (as applicable), ii) Packing List, iii) LR/Receipted LR, iv) CRAC/MRC (issued by project site engineer of Buyer/Owner), v) Guarantee Certificate, vi) E-way bill (as applicable), vii) Copy of valid Insurance document and Intimation,

	viii) Proof for submission of Performance Security (if applicable), ix) Copy of BHEL MDCC, x) PVC Calculation & copy of all applicable indices (if PVC is applicable) **b) <u>For Services</u>:** i) Original Tax Invoice/e-Invoice (as applicable) & ii) CRAC/certification by Buyer's Site or Engineering (as applicable) **15.4** Payments to Supplier's shall be released only after: a) Supplier has declared such invoice in GSTR-1as per the relevant GST Act. b) The tax component charged by the Supplier in the invoice matches with the details uploaded by the Supplier in GSTR-1and GST liability is discharged through GSTR 3B. In case, any GST credit is delayed/denied to the Buyer due to non/delayed receipt of goods and/or tax invoice or expiry to timeline prescribed in the relevant GST Act for availing such ITC, or any other reasons not attributable to the Buyer, tax amount shall be recovered from the Supplier along with interest levied/ leviable on the Buyer. **15.5** RXIL is an initiative instituted by Govt. of India for MSMEs. PEM strongly advise all the MSME suppliers to get themselves registered on RXIL(TreDs) for faster payments. **15.6 Time line for Payment:** Payment shall be made within timeline as mentioned below from the date of issue of consignee receipt-cum-acceptance certificate (CRAC)/MRC/Completion of Services certified by Buyer's Site/Engineering. a) Within 45 days for Supplier qualified and registered as Micro or small enterprises as per MSMED Act b) Within 60 days for Supplier qualified and registered as Medium enterprises as per MSMED Act c) Within 90 days for suppliers other than (a) & (b) above The supplier shall ensure submission of complete documents along with the bill. In case of incomplete documents, the bill shall be rejected, and next due date shall start from the date of closure of discrepancy by the Supplier. **Provision of payment outside GeM shall be utilized.** **15.7** Notwithstanding anything to the contrary contained in any other document comprising the contract, no interest shall be payable by the Buyer to the Supplier on any money or balances including but not limited to the security amount, Performance Security amount, bank guarantee amount, EMD, retention money, any bills or any amount withheld which may become due owing to difference or misunderstanding or any dispute between the Buyer and the Supplier, or any delay on the part of Buyer in making periodical or final payment or any other aspects incidental thereto.
16	**PERFORMANCE SECURITY- Applicable**
16.1	Supplier may opt any of the following for submission of Performance Security: - 16.1.1: Initially 10% of the contract value (Total Order value excluding PVC). 5% of the contract value (excluding PVC) will be released after completion of Main Supply based on certification by

	PG. However, balance 5% of the contract value (excluding PVC) will be released on completion of all contractual obligations, including guarantee/warranty obligations based on certification by PG. Or 16.1.2: 5% of the contract value (total Order value excluding PVC). Additional 5% of the contract value (excluding PVC) will be deducted & retained from first bill & subsequent bill(s) of the same contract (in case the value of first bill is less than 5% of the contract value). The retention amount will be released after completion of Main Supply based on certification by PG. However, balance 5% of the contract value (excluding PVC) will be released on completion of all contractual obligations, including guarantee/warranty obligations based on certification by PG. This percentage supersedes the GeM enquiry SD/Performance Security percentage. Initial validity of performance security shall be 27 months from PO date (considering delivery period of approx. 6 & HALF months (150 days delivery) + 18 months guarantee period + 2 months claim period already mentioned in GTC Cl. No. 7.ii GeM 3.0). Further extension, if any, shall be as per GeM Terms.
16.2	**Modes of Deposit**: Supplier has to furnish Performance Security in the following forms: (i) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL. (ii) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL. (iii) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL). (iv) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL). (v) Insurance Surety Bond. BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.
16.3	Performance Security is to be furnished within 14 days from the date of PO/LOA and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations. Initial validity of Performance Security shall be as per GeM Bid. However, Performance Security validity is to be extended based on the actual delivery of package.
16.4	Performance Security value can be proportionately reduced after completion of Guarantee Period Unit-wise/ Stage-wise/Set-wise/Scope wise (Main Supply/Mandatory spares/Services excluding PG test) subject to the units/sets/stages/Scope (Main Supply/Mandatory spares) being explicitly specified in delivery terms in the contract. However, Performance Security for the last unit/set/stage will be released only after completion of all contractual liability or guarantee period, whichever is later.
16.5	**Forfeiture and Release/Return of Performance Security**: i) The Performance Security will be forfeited and credited to BHEL's account in the event of a breach of contract by the Supplier.

	ii) Performance Security shall be refunded to the Supplier without interest, after he duly performs and completes the contract in all respects but not later than 60 (Sixty) days of completion of all such obligations including guarantee/warranty under the contract. iii) If Performance Guarantee (PG)/ Demonstration Test and handing over of the system/ package (if applicable), as per Order/ Contract is not conducted up to 36 months from supply completion for reasons not attributable to the Supplier then Performance Security for total contract shall be released on submission of undertaking by the Supplier that Performance Guarantee (PG)/ Demonstration Test and handing over of the system/ package shall be conducted as and when required by Buyer.
16.6	The Performance Security shall not carry any interest.
17	**LIQUIDATED DAMAGES (LD): -**
	Timely dispatch/delivery and completion of other schedules as stipulated in Order/Contract shall be the essence of Order/Contract. If the Supplier fails to complete the dispatch/delivery and other schedules within the time period stipulated in Order/Contract, or within any extension of time granted by the Buyer, it shall be lawful for Buyer to recover damages for breach of Order/Contract and hereunder. **17.1** Buyer reserves the right to recover from the Supplier, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent of the total main supply contract value excluding GST per week or part thereof, subject to a maximum of ten (10) percent of the total of main supply contract price excluding GST, if the Supplier fails to deliver any part of the ordered goods/stores within the period stipulated in the Order/ Contract. **17.2** LD on service portion where delivery for services are defined separately in the Order/Contract. LD shall be applicable @ ½ percent, of the total service contract value excluding GST per week or part thereof. However, total LD (main supply and services) shall be limiting to 10% of cumulative total contract value (main supply +services) excluding GST. **17.3** LD on mandatory spares portion where delivery for mandatory spares is defined separately in the Order/Contract. LD shall be applicable @ ½ percent, of the total of mandatory spares contract value excluding GST per week or part thereof, limiting to 10% of total contract value of mandatory spares excluding GST. **17.4** In case of any amendment/ revision, LD shall be linked to the amended/ revised contract value and delivery date(s). **17.5** LR/RR date for indigenous supplies shall be treated as the date of dispatch for levying LD. However, if date of receipt at site for indigenous supply is beyond the maximum validity of E-way bill as per extant govt. GST law then such excess period shall also be considered for LD purpose irrespective of the dispatch date. **17.6** If Order/ Contract involves two or more Units/ Sets/ Stages, then Liquidated Damages shall be levied on order/ contract value excluding GST of the delayed Unit/ Set/ Stage, provided delivery stipulated in the Order/ Contract is Unit/ Set/ Stage wise and total LD amount shall be limited to 10% of total Order/ amended Order value excluding GST of delayed Unit/ Set/ Stage. **17.7** The sum specified above is not a penalty but a genuine pre-estimate of the loss/ damage which will be incurred by the Buyer directly or indirectly on account of delay in delivery of

	material/equipment/services on the part of the Supplier and the said amount will be deductible without proof of actual loss or damage caused by such delay.
18	**GUARANTEE TERMS-**
	18.1 Guarantee Period (Unit-wise, Stage-wise, Set-wise, System-wise - as applicable) for Supply package shall be Eighteen (18) months from the date of last dispatch. **18.2** All Shortages/damages in sound cases shall be replenished free of cost by the Supplier, as early as possible however, not exceeding more than 45 days from the time of reporting the shortage/damage. **18.3** For shortages/damages during transit, Supplier shall supply replacements free of cost as early as possible, within 45 days from the time of reporting the defect/ loss/ rejection etc. by the Buyer/ Owner/ Site. **18.4** For shortages/damages during handling at site, Supplier shall supply replacements, as early as possible, at the old contractual rates upon intimation to Supplier within 45 days from the time of reporting the defect/ loss/ rejection etc. **18.5** All replacements and repairs during the guarantee period shall be delivered and completed promptly and satisfactorily within a period of 45 days from the time of reporting the defect/ loss/ rejection etc. Damaged items/parts can be taken back by Supplier on his own cost with the permission of Owner. **18.6** All the replaced and replenished plant/ equipment/ stores shall also be guaranteed as per PO terms.
19	**INSPECTION**
	19.1 Buyer and/or Buyer's nominated Inspection Agency shall have at all reasonable times access to Supplier's premises or works and shall have the power at all reasonable times to inspect drawings of any portion of the work or examine the materials and workmanship of the plant/ equipment/ stores during their manufacture, and if part of the plant/ equipment/ stores is manufactured at other premises, the Supplier shall arrange for inspection, examination and testing by the Inspection Agency as if the plant/ equipment/ stores is manufactured on the Supplier's premises. Procedure for approval of works shall be as per the procedure given on https://cqir.bhel.in/Cqir/jsp/Masters/Help_File_for_suppliers.pdf Inspection calls should be raised by the Supplier on BHEL - Quality Surveillance System (https://cqir.bhel.in). Such inspection, examination and testing by itself shall not relieve the Supplier from any obligation under the Order/ Contract. **19.2** Supplier shall give Inspection Agency reasonable notice of 15 days of any material being ready for testing and the Inspection Agency shall (unless the inspection of tests is voluntarily waived) attend at the Supplier's premises within seven (7) days of the date on which the

	material is notified as being ready. Tests are to be performed as per Buyer approved QAP (if applicable). **19.3** In case of delay in witnessing of inspection beyond stipulated time (i.e. 7 days from the proposed date of inspection as notified by the Supplier through e-mail/call raised on BHEL - Quality Surveillance System (https://cqir.bhel.in) by the Buyer arising due to reasons not attributable to Supplier, Buyer will extend the delivery period for such delay in witnessing inspection. If the Buyer is not able to witness inspection up to 15 days then in addition to delay beyond stipulated period, 7 days' additional time shall also be given to the Supplier to facilitate for arranging fresh inspection. **19.4** Where the Order/ Contract provides for tests/ inspections at the premises or works of the Supplier or any Sub-Contractor, the Supplier, except specified otherwise, shall provide free of charge such assistance, labour, materials, electricity, fuel, water, stores, apparatus, measuring instruments and test equipment including any other facilities as may be reasonably required to carry out such tests efficiently.
20	**MATERIAL DISPATCH CLEARANCE CERTIFICATE (MDCC)**
	20.1 When the tests have been satisfactorily completed at Supplier's works, the Inspection Agency shall issue an inspection report that effect within seven (07) days after completion of the tests, but if the tests were not witnessed by the Inspection Agency or his representative, the material acceptance report would be issued within seven (07) days after receipt of the test certificates by the Buyer. **20.2** Buyer will issue MDCC to the Supplier within 7 days based on inspection report/ test certificates/Certificate of Conformance as applicable. In case of delay in issuance of MDCC beyond 7 days stipulated time (i.e. from the date of receipt of Inspection Report/Test certificates), by the Buyer due to reasons not attributable to the Supplier, Buyer shall extend the delivery period for such delay in issuing MDCC. If the Buyer is not able to issue MDCC up to 15 days then in addition to delay beyond stipulated period, 7 days' additional time shall also be given to the Supplier to facilitate for arranging logistics arrangements. **20.3** Supplier shall not dispatch any material before issue of MDCC by the Buyer.
21	**PACKING LIST-**
	Packing shall be in conformity with specifications and shall be such as to ensure prevention of damages, corrosion, deterioration, shortages, pilferage and loss in transit or storage. Suppliers to submit Packing List along with advance set of documents for claiming payment which must indicate: i. No. of boxes ii. Packing size. iii. Gross weight and net weight of each package. iv. Contents of the package with cross reference to BoM item code no. or item serial no. v. Quantity of each item separately.

	The Packing list must cover all the BoM items and supplier to give the following undertaking in the Packing List: "The Packing List provided herewith is as per the BoM approved under Contract No.-……dated- ……."
22	**DELIVERY EXTENSION: EXTENSION OF CONTRACTUAL DELIVERY TIME**
	Delivery time mentioned in the NIT includes Engineering completion time (time for drawing/document submission/resubmission by the Supplier and review/approval of the same by the Buyer/Owner), manufacturing, inspection, Packing and dispatch time. Due diligence is to be observed by the Supplier to ensure timely completion of engineering and supply. During the execution of the contract, time loss occurred owing to the reason attributable to the Buyer besides force majeure shall be considered for delivery time extension to the Supplier as given below: i) Any Delay in providing comments/ approval on Primary drawing/documents beyond the stipulated time as specified in NIT. ii) Time Loss in approval of the drawing/document as a result of increase in the iteration not attributable to the Supplier (i.e. resubmission owing to end customer comments) as certified by Buyer. Time extension equivalent to the resubmission time noted in the tech. spec and consequential increase in the approval time in lieu of increase in iteration shall be applicable. However, for incomplete re- submission time loss shall be in the Supplier's account. iii) Delay in providing engineering input by Buyer. iv) Delay in deputing inspector for inspection and delay in release of MDCC in line with clause no. 20 above. v) Any hold put by Buyer for whatever reasons during execution of contract (within contract validity period), time extension equivalent to hold period shall be admissible. However, in the event hold period continues for more than 30 days then, an additional 15 days for the purposes of mobilization and demobilization of resources shall also be admissible. Supplier to note that Extension in delivery period if any with or without imposition of LD shall be considered after detailed delay analysis based on provisions given above. Supplier to provide dates of drg./doc. submission & re-submission (if any) within 7 days of Cat-I approval. However, no delay analysis will be applicable if supply is completed within delivery schedule as specified in Order/ Contract.
23	**BREACH OF CONTRACT, REMEDIES AND TERMINATION**
	In case of Breach of Contract, BHEL shall recover 10% of the contract value from the Supplier using following instruments: (i) encashment of security instruments like EMD, Performance Security with PEM against the said contract. (ii) balance amount (if value of security instruments is less than 10% of the contract value) from other financial remedies i.e. available bills of the Supplier, retention amount etc. with PEM. (iii) balance amount from security instruments like EMD, Performance Security and other financial remedies i.e. available bills of the Supplier, retention amount etc. with other units of BHEL. (iv) Any other mode as deemed fit by the Buyer at its sole discretion. (v) if recovery is not possible then legal remedies shall be pursued. However, Supplier shall continue performance of the Order/ Contract, under all circumstances, to the extent not cancelled.

24	**SUSPENSION OF BUSINESS DEALINGS**
	The "Guidelines on Suspension of Business Dealings with Suppliers/ Contractors" is placed at https://www.bhel.com/supplier-registration and, same shall prevail over Incident Management Policy of GeM.
25	**SUPPLIER PERFORMANCE MONITORING AND RATING SYSTEM**
	Supplier's performance will be evaluated as per Supplier Performance Monitoring and Rating System of BHEL. Please refer BHEL website www.bhel.com for details.
26	**CONFIDENTIALITY**
	Supplier shall, at all times, undertake to maintain complete confidentiality of all data, information, software, drawings & documents, etc. belonging to the Buyer and also of systems, procedures, reports, input documents, manuals, results and any other company documents discussed and/ or finalized during the course of execution of Order/ Contract. i.e. Supplier shall in no way share or use such intellectual property of Buyer to promote his own business with others. Buyer reserves the right to claim damages from the Supplier, or take appropriate penal action as deemed fit against the Supplier, for any infringement of the provisions contained herein.
27	**INTELLECTUAL PROPERTY & LICENSES**
	If any patent, design, trademark, trade secret or any other intellectual property rights apply to the delivery or accompanying documentation/drawings, Buyer or its customer shall be entitled to the legal use thereof free of charge by means of a non-exclusive, assignable, transferrable, sub-licensable, worldwide, perpetual license. All intellectual property rights that arise due to the execution of the delivery by the Supplier and by its employees or third parties involved by the Supplier for the performance of the contract shall be promptly notified by the Supplier to the Buyer and shall be deemed to belong to the Buyer. The Supplier shall be obligated to cooperate with the Buyer and do everything necessary to obtain or perfect the above-mentioned rights in favour of the Buyer. The Supplier represents and guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. In the event a third party makes a claim, the Supplier shall also be obligated to do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties. The Supplier agrees to indemnify, defend and hold harmless the Buyer, its officers, employees, agents, representatives, successors, assignees or any of the Buyer's customers buying or using the goods or services specified herein, against any actual or alleged infringement of such intellectual property interests, claims by third parties in this regard and shall pay to the Buyer merely on demand without demur and without requiring the Buyer to furnish any proof of such claim, such sum as indicated in the demand towards any liabilities, damages, penalties, injuries, claims, demands, actions, cost and expenses etc. suffered as a result thereof. The Supplier agrees that its liability under this clause shall be unlimited.
28	All other terms & conditions shall be as per GeM bid, above GeM Additional Terms & Condition and GTC on GeM 4.0 (version 1.14 dated 31.01.24.
29	MSE preference shall be given.
30	***Consignee details of Parichha R &M shall be as below: -** 2x210 MW Parichha-II TPS, Jhansi, Uttar Pradesh 284305 BHEL PSNR GSTIN No.- 09AAACB4146P2ZC **For creation of GeM bid, temporary consignee details are being used for Parichha R &M, final consignee details shall be as per above details only.**

Letter head of Company (<Rs. 10 Cr value)

Ref……. Date…….

To,
Bharat Heavy Electricals Limited
PS-PEM, PPEI Building,
Plot No. 25, Sector -16A,
Noida (U.P.) - 201301

Subject: - Certification regarding local content

Reference: Tender Enquiry No**.- GeM Bid no. ……dt. 17.06.2024**
Name of Package: **Lighting Distribution Board**
Dear Sir,

We hereby certify that items offered by us of **Lighting Distribution Board** for **PARICCHA ESP R&M Project** meets the requirement of minimum local content in line **GeM Bid no. ……dt. 17.06.2024** and the Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019, 04.06.2020 & 16.09.2020.

Local Content - .....%

We further confirms that details of location at which the local value addition is made will be our registered works at ……(address of the works)

Yours very truly
……..(authorized signatory of company)
……..(firm name)

Letter head of Company

Ref……. Date…….

MODEL CERTIFICATE

Reference: Tender Enquiry Ref- **GeM Bid no. …….. dt. 17.06.2024**
Name of Package: **Lighting Distribution Board**

Dear Sir,

This has reference to: -

Our Offer for Supply of **Lighting Distribution Board for PARICCHA ESP R&M Project** against GEM Tender No. **……..dt. 17.06.2024.**

1. Order dated 23.07.2020 reg. restriction under rule 144 (xi)of GFR issued by Ministry of Finance, Department of Expenditure Public Procurement Division.

I have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India. I hereby certify that **M/s ……**, is not from such a country and is eligible to be considered.

Thanking you.

Yours very truly
……..(authorized signatory of company)
……..(firm name)
Company's Seal/stamp

Letter head of Company

Ref……. Date…….

Reference: Tender Enquiry Ref- **GeM Bid no. …… dt. 17.06.2024**
Name of Package: **Lighting Distribution Board**

NO COMMERCIAL DEVIATION

Yours very truly
……..(authorized signatory of company)
……..(firm name)
Company's Seal/stamp

Letter head of Company

Ref……. Date…….

Reference: Tender Enquiry Ref- **GeM Bid no. ……..dt. 17.06.2024**
Name of Package: **Lighting Distribution Board**

NO TECHNICAL DEVIATION

Yours very truly
……..(authorized signatory of company)
……..(firm name)
Company's Seal/stamp