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### GeM Tender Enquiry for Lighting Fixtures, Lamp and Misc. Items for 3x 660 MW NTPC BARH-STAGE-I FGD

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3X660 MW NTPC BARH STPP STAGE I FGD				
LIGHTING FIXTURES,LAMPS & MISC. ITEMS				
BOQ CUM UNPRICED SCHEDULE				
ANNEXURE-I				
Sr. No.	Item code	Item description	Unit	Order Quantity
<b>A</b>	<b>Lighting Luminaires (complete with accessories)</b>			
1	558-12118-A	Luminaire Type FC06 (LED)	Nos.	435
2	558-12120-A	Luminaire Type FC81 (LED)	Nos.	15
3	558-12195-A	Luminaire Type FC07 (LED)-DC	Nos.	16
4	558-12196-A	Luminaire Type FC33 (LED)-DC	Nos.	6
5	558-12197-A	Luminaire Type FC34 (LED)-DC	Nos.	10
6	558-12201-A	Luminaire Type SF63 (LED)	Nos.	18
7	558-12199-A	Luminaire Type SB02 (LED)	Nos.	85
8	558-12200-A	Luminaire Type SB03 (LED)	Nos.	40
9	558-12122-A	Luminaire Type SS62 (LED)	Nos.	95
10	558-12205-A	Luminaire Type SW41 (LED)	Nos.	275
11	558-12206-A	Luminaire Type SW42 (LED)	Nos.	55
12	558-12140-A	Luminaire Type FC30 (LED)	Nos.	76
<b>B</b>	<b>Switch boxes for individual control of circuits</b>			
1	558-12014-A	Type SWB1 Decorative	Nos.	20
2	558-12015-A	Type SWB2 Decorative	Nos.	15
3	558-12016-A	Type SWB3 Decorative	Nos.	10
4	558-12099-A	Type SWB4 Decorative	Nos.	4
<b>C</b>	<b>Junction boxes</b>			
1	558-12026-A	Type JB-F	Nos.	1076
2	558-12027-A	Type JB-FE	Nos.	15
<b>D</b>	<b>Receptacles</b>			
1	558-12079-A	Type RA	Nos.	22
2	558-12081-A	Type RB	Nos.	42
3	558-12082-A	Type RC	Nos.	12
<b>E</b>	<b>Fans</b>			
1	558-12010-A	Ceiling fan 1200 mm sweep	Nos.	10
2	558-12094-A	Pedestal fan	Nos.	10
<b>F</b>	<b>Emergency lighting Units</b>			
1	558-12018-A	With Ni-Cd battery and 2 X 10W LED	Nos.	12
<b>G</b>	558-12253-A	FLEXIBLE CONDUIT, TERNE COATED	Mtr.	1500
<b>H</b>	<b>Ladder</b>			
1	558-12022-A	Free standing adjustable from 5M to 10M aluminium ladder	Nos.	1
2	558-12091-A	10m high car wheel mounted adjustable aluminium ladder adjustable upto 10m high	Nos.	1
<b>I</b>	558-12019-A	EXIT SIGN	Nos.	10
<b>J</b>	558-12139-A	OCCUPANCY SENSOR	Nos.	5
<b>K</b>	<b>Drivers-Lighting Luminaires</b>			
1	558-12231-A	Driver-Luminaire Type FC06 (LED)	Nos.	5

**3X660 MW NTPC BARH STPP STAGE I FGD****LIGHTING FIXTURES,LAMPS & MISC. ITEMS****BOQ CUM UNPRICED SCHEDULE  
ANNEXURE-I**

<b>Sr. No.</b>	<b>Item code</b>	<b>Item description</b>	<b>Unit</b>	<b>Order Quantity</b>
<b>2</b>	558-12235-A	Driver-Luminaire Type FC07 (LED)-DC	Nos.	2
<b>3</b>	558-12236-A	Driver-Luminaire Type FC33 (LED)-DC	Nos.	2
<b>4</b>	558-12237-A	Driver-Luminaire Type FC34 (LED)-DC	Nos.	2
<b>5</b>	558-12250-A	Driver-Luminaire Type FC30 (LED)	Nos.	5
<b>6</b>	558-12233-A	Driver-Luminaire Type FC81 (LED)	Nos.	2
<b>7</b>	558-12242-A	Driver-Luminaire Type SB02 (LED)	Nos.	5
<b>8</b>	558-12243-A	Driver-Luminaire Type SB03 (LED)	Nos.	5
<b>9</b>	558-12238-A	Driver-Luminaire Type SF63 (LED)	Nos.	2
<b>10</b>	558-12244-A	Driver-Luminaire Type SS62 (LED)	Nos.	5
<b>11</b>	558-12246-A	Driver-Luminaire Type SW41 (LED)	Nos.	5
<b>12</b>	558-12247-A	Driver-Luminaire Type SW42 (LED)	Nos.	5
<b>L</b>	<b>Structural steel</b>			
<b>1</b>	558-12085-A	Structural steel	MT	3
<b>M</b>	<b>Hume Pipe</b>			
<b>1</b>	558-12025-A	Hume pipe 100 mm dia	mtrs.	50
<b>N</b>	<b>GI wire &amp; Flat</b>			
<b>1</b>	558-12023-A	14 SWG Wire	mtrs.	14000
<b>2</b>	558-12097-A	25X6 mm GS Flat	mtrs.	300
<b>3</b>	558-12008-A	50X6 mm GS Flat	mtrs.	100
<b>4</b>	558-12007-A	40 mm Dia MS Rod	meter	270
<b>NOTES</b>				
<b>1</b>	CONTAINERS AS PER SPECIFICATION ARE TO BE SUPPLIED ALONG WITH FIRST SUPPLIES. THE PRICE OF CONTAINER IS DEEMED TO BE INCLUDED IN PACKAGE PRICE. NO SEPARATE CHARGES FOR CONTAINER WILL BE PAYABLE.			
<b>2</b>	THE MATERIAL SHALL BE SUPPLIED IN LOTS. LOTS SHALL BE RELEASED PROGRESSIVELY BASED ON APPROVED CONDUIT LAYOUT DRAWINGS OF DIFFERENT AREAS AND PROJECT			
<b>3</b>	LIGHTING SYSTEM DESIGN CHARGES ARE DEEMED TO BE INCLUDED IN THE PRICE OF ABOVE ITEMS. NO SEPARATE CHARGES FOR DESIGN ACTIVITY WILL BE PAYABLE.			
<b>4</b>	For item at Sl. No A above "Lighting Luminaires", the above quantity variation shall be calculated at the total order value against item at Sl. No A (i.e. sum of order value of sub			
<b>5</b>	TYPE TESTS CHARGES ARE DEEMED TO BE INCLUDED IN THE PRICE OF ABOVE ITEMS. NO SEPARATE CHARGES FOR TYPE TESTING WILL BE PAYABLE.			

**3X660 MW NTPC BARH STPP STAGE I FGD****LIGHTING FIXTURES,LAMPS & MISC. ITEMS****BOQ cum Price Schedule  
(MANDATORY SPARES)  
ANNEXURE-IA**

<b>Sr. No.</b>	<b>Item description</b>	<b>Unit</b>	<b>Order Quantity</b>
<b>A</b>	<b>Lighting Luminaires (complete with accessories)</b>		
1	Luminaire Type FC06 (LED)	Nos.	5
2	Luminaire Type FC81 (LED)	Nos.	5
3	Luminaire Type FC07 (LED)-DC	Nos.	5
4	Luminaire Type FC33 (LED)-DC	Nos.	5
5	Luminaire Type FC34 (LED)-DC	Nos.	5
6	Luminaire Type SF63 (LED)	Nos.	5
7	Luminaire Type SB02 (LED)	Nos.	5
8	Luminaire Type SB03 (LED)	Nos.	5
9	Luminaire Type SS62 (LED)	Nos.	5
10	Luminaire Type SW41 (LED)	Nos.	5
11	Luminaire Type SW42 (LED)	Nos.	5
12	Luminaire Type FC30 (LED)	Nos.	5

NOTE : The requirement for mandatory spare as per above BOQ cum unprice schedule shall be fully complied with.

**3X660 MW NTPC BARH STPP STAGE I FGD  
LIGHTING FIXTURES,LAMPS & MISC. ITEMS  
BOQ cum Price Schedule  
(SUPERVISION OF ERECTION & COMMISSIONING)  
ANNEXURE-I B**

SR. No.	ITEM CODE	ITEM DESCRIPTION	UOM	Quantity	UNIT RATE(INR)
<b>1.0</b>	<b>558-12086-A</b>	<b>SUPERVISION OF ERECTION &amp; COMMISSIONING</b>			
1.01		CHARGES PER VISIT	VISIT	4	20000
1.02		MANDAYS CHARGES	DAYS	20	5000

Notes :

1. For supervision of E&C 4(four) Visits and 20 (twenty) Mandays to be considered. The prices shall be inclusive of charges of Airfare (To & Fro), Boarding, Lodging, Medical, Insurance etc.
2. Amount payable per visit = Visit charges as per Sl. No 1.01 above (+) Unit Price for mandays charges as per Sl. No 1.02 above (x) No. of mandays at site (to be certified by BHEL Site)
3. The total Mandays mentioned for supervision of E&C also include Mandays of inspection of installation for completeness and correctness of work.
4. Unit rate for 1.01 and 1.02 above shall remain firm. Supervision of E&C rate shall not be considered for price evaluation.
5. Nos. of visit and Mandays for supervision of E&C may increase based on project requirement.

## **Annexure II**

**An undertaking regarding Model Clauses on company letter head only**

**(To be provided along with bid)**

Reference: NIT No.-

Package: - Lighting Fixtures, Lamps and Misc. Items

Project: 3x 660 MW NTPC BARH STAGE I FGD

### **TO WHOM SO IT MAY CONCERN**

This is with reference to Ministry of Finance circular dated 23.02.23 reg. restriction under rule 144 (xi) of GFR.

“I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India. I hereby certify that M/s ..... (bidder name) is not from such a country and is eligible to be considered/participate in tender enquiry for against aforesaid tender enquiry.

Sign & Signature (Not below Director/owner of the company)

Date:

Place:

**ANNEXURE III**  
**2X660 MW NTPC BARH STAGE I FGD**  
**Lighting Fixtures, Lamps and Misc. Items**  
**Letter head of Company**

Ref.....

Date.....

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

**Subject: - Certification regarding local content**

Reference: Tender Enquiry No-.....

Package: - Lighting Fixtures, Lamps and Misc. Items

Project: 2X660 MW NTPC BARH STAGE I FGD

Dear Sir,

We hereby certify that items offered by us of Lighting Fixtures, Lamps and Misc. Items for 2X660 MW NTPC BARH STAGE I FGD .....(minimum % of local content) meets the requirement of minimum local content in line with applicable clause of Make In India and the Public Procurement (Preference to Make in India), Order 2017 dated- 15.06.2017, 28.05.2018 & 29.05.2019, 04.06.20, 16.09.20 and subsequent order dated 16.11.21.

We further confirm 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)

authorized signatory  
of company

**3X660 MW NTPC BARH STPP STAGE I FGD**

TECHNICAL SPECIFICATION  
FOR  
**LIGHTING FIXTURES, LAMPS & MISC. ITEMS**

SPECIFICATION No. **PE-TS-442-558-E001**

ISSUE NO. 01

REV NO. 00



BHARAT HEAVY ELECTRICALS LIMITED  
POWER SECTOR  
PROJECT ENGINEERING MANAGEMENT  
NOIDA, INDIA



TECHNICAL SPECIFICATION  
LIGHTING FIXTURES, LAMPS & MISC. ITEMS  
3X660 MW NTPC BARH STPP STAGE I FGD

PE-TS-442-558-E001

Issue No: 01

Rev. No. 00

Date : 17.05.2024

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	<b>TECHNICAL SPECIFICATION</b> <b>LIGHTING FIXTURES, LAMPS &amp; MISC. ITEMS</b> <b>3X660 MW NTPC BARH STPP STAGE I FGD</b>	PE-TS-442-558-E001
		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

### PROJECT INFORMATION

SL.NO	DESCRIPTION	DETAILS
1	<b>METEOROLOGICAL DATA</b>	
1.1	MAXIMUM TEMPERATURE	44°C
1.2	MINIMUM TEMPERATURE	5°C
1.3	MAXIMUM RELATIVE HUMIDITY	83
1.4	MINIMUM RELATIVE HUMIDITY	23
1.5	AVERAGE ANNUAL RAINFALL	1145
1.6	SEISMIC ZONE (AS PER IS 1893)	Zone III
1.7	HEIGHT ABOVE MSL	49 m
2	<b>ELECTRICAL DATA</b>	
2.1	AMBIENT TEMPERATURE FOR DESIGN OF ELECTRICAL EQUIPMENT	50 deg. Centigrade,
2.2	RATED FREQUENCY	50 HZ
2.3	FREQUENCY VARIATION	+3% & -5%
2.4	AC VOLTAGE	415,240 V
2.5	AC VOLTAGE VARIATION	-10% to +10%
2.6	DC VOLTAGE	220V DC
2.7	DC VOLTAGE VARIATION	-15% to +10%
2.8	FAULT LEVEL (KA/SEC)	9kA for fixtures

	<b>TECHNICAL SPECIFICATION</b> <b>LIGHTING FIXTURES, LAMPS &amp; MISC. ITEMS</b> <b>3X660 MW NTPC BARH STPP STAGE I FGD</b>	PE-TS-442-558-E001
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### SCOPE


#### SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:


SL.NO	PARAMETERS	REQUIREMENT
1	Supply Including Design, Engineering, Manufacturing of Lighting Fixtures, Lamps & Misc. items	YES
	a) Main Supply	YES
	b) Commissioning Spares	NO
2	Painting	NO
3	Inspection & Testing	YES
4	Packing	YES
5	Transportation & Delivery To Site	YES
6	Erection & Commissioning	NO
7	Supervision of Erection & Commissioning	YES
8	Mandatory Spares	YES
9	O & M Service	NO
10	O & M Spares	NO


	<b>TECHNICAL SPECIFICATION</b> <b>LIGHTING FIXTURES, LAMPS &amp; MISC. ITEMS</b> <b>3X660 MW NTPC BARH STPP STAGE I FGD</b>	PE-TS-442-558-E001
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<b>GENERAL TECHNICAL REQUIREMENT</b>	
1	Following items are excluded from the scope of supply of this package: Poles, Mast, LDB, WDB, Lighting panels, Rigid conduit, earthing material and PVC Wires, Cables.
2	It is not the intent to specify herein all the details of design and manufacturing, Bidder shall ensure that the offered equipment confirms in all respects to high standards of design, engineering and workmanship.
3	Bidder shall also ensure that the offered equipment shall comply with all applicable statutory and regulatory requirements.
4	In the event of any conflict between the requirements of two clauses of this specification, documents or requirements of different codes and standards specified, the more stringent requirement as per the interpretation of the owner shall apply.
5	Drawing/document submission shall be through web based Document Management System(DMS) of BHEL. Bidder would be provided access to the DMS for drawing/document submission. Bidder to ensure internet connectivity of min speed of 2Mbps at their end.
6	Drawings/ documents submitted by vendor at any stage shall be complete in all respects. Any incomplete drawing submitted shall be treated as non- submission with delays attributable to vendor. For any clarification/ discussion required to complete the drawings, the bidder shall depute his personnel to BHEL / Customer's Office as per the requirement for across the table submission/ finalizations of drawings.
7	Latest codes and standards shall be complied with as on date of techno-commercial bid opening.
8	Bidder shall submit Quality Plan in the event of order based on the Quality Plan enclosed therein on compliance route. Inspection / testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc.
9	Equipment must be safe, reliable and easy to maintain at all operating conditions
10	The equipment shall comply with all applicable safety codes and statutory regulations of India as well as of the locality where the equipment is to be installed. Statutory and regulatory regulation shall be applicable as per Indian Electricity Rule, 2005 with latest amendment for illumination & low voltage power services
11	The illumination system shall be designed on the basis of best engineering practice and shall ensure uniform, reliable, aesthetically pleasing and glare free illumination. All fixtures shall be of proven design for applications in power plant environment. The lighting fixtures shall be designed for minimum glare. The design shall prevent glare/luminous patch seen on VDU/ Large video screens, when viewed from an angle. The finish of the fixtures shall be such that no bright spots are produced either by direct light source or by reflection. The diffusers/ louvers used in fixtures shall be made of impact resistant polystyrene sheet and shall have no yellowing property over a prolonged period.
12	Following sizes of 1100 V grade, Light Duty PVC insulated unsheathed, single core, stranded copper conductor wires will be used:  * Lighting Panel to JB's/ Switches: 1.5 sq. mm (Cu Wire) * JB's/ switches to Fixtures: 1.5 sq. mm (Cu Wire) * Panel to First receptacles: 4.0 sq. mm (Cu Wire) * First receptacles to looping other receptacles: 4.0 sq. mm (Cu Wire) * In case of only one receptacles in ckt., Panel to receptacles: 4.0 sq. mm (Cu Wire) * Panel/ JB's to flood light fixtures: 2-1C x 1.5 sq. mm (Cu Wire)  Note: Wires & Cables are not in vendor's scope of supply, however vendor to show size & quantity in CLO drawings.
13	Earthing of lighting system will be done by using of following sizes of wire / flat: Lighting fixtures, receptacles, conduits, junction boxes & switch boxes: 14 SWG GI wire Welding receptacles: GS Flat 25x6 mm All the earthing to various equipment like receptacles, junction boxes etc shall be provide at two point. Note : Earthing material is not in bidder's scope of supply . However, Bidder shall make suitable provision for earthing for the equipment in their scope of supply.
14	Bidder shall confirm compliance with the Standard Quality Plan no. 000-0-999-QOE-S-062 (enclosed with the specification) without any deviations.
15	Luminaires suitable for surface mounting shall also be suitable for pendant mounting. Knockouts of 20mm ET conduit fixation shall be provided for this purpose.
16	Recessed type decorative luminaires shall be suitable for mounting with gypsum boards / luxalon / plaster of Paris/ aluminium frame false ceiling of standard size
17	Typical Mounting arrangement of Lighting fixtures is shown under compliance drawings, all indicated accessories required for mounting of fixtures shall be supplied along with the respective lighting fixture.
18	Vendor shall prepare and submit Lighting layout and Conduit layout drawings considering the following requirements for purchaser's approval :


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18.1	<p>Lighting calculations for indoor areas covering details such as room dimensions (length, width, height), illumination level, maintenance factor (Dust prone indoor/outdoor areas: 0.6, Control room, office area/ air conditioned areas : 0.8, Indoor areas (non-ac): 0.7), reflection factor (For AC Areas/ White n light colors ceiling : 70, wall : 70, floor : 10 &amp; For non-conditioned area: ceiling : 50, wall : 50, floor : 10) , type of luminaire, mounting height of luminaire, room index, coefficient of utilisation, no. of luminaires (AC Normal &amp; AC Emergency), lumen output of each luminaire, reference drawings and remarks.</p> <p>Working height from floor level should be considered as 0.85 m.</p> <p>Lighting design for indoor areas will be done by LUMEN method only.</p> <p>For a given indoor area, number of luminaires is calculated as follows:            Number of luminaires = (L x W x LUX LEVEL (Average))/ (LUMEN x COU x MF)            Where, L= Length of room (Restricted to Max. 5 times of width)            W= Width of room            LUMEN= Lumen output of each lamp            COU= Coefficient of Utilisation            MF= Maintenance Factor</p> <p>Coefficient of Utilisation (COU) is determined from the COU chart for a particular luminaire of the manufacturer, corresponding to selected reflection factors and calculated Room Index.</p> <p>Room index should be calculated using the following formula : ( Lx W ) / (( L+W ) x MH)            where MH : Mounting height of luminaire . L&amp;W : Length and width of the room</p>	
18.2	<p>Apart from maintenance factors given above, temperature correction factor shall be considered in the lighting design for fixtures located in non air conditioned areas.</p>	
18.3	<p>Lighting calculations for outdoor areas covering average illumination level, type of luminaire, chart for illumination level at various points in the area; location (coordinates), number and height of poles; type, number (normal + emergency) and orientation of luminaires etc. Lighting design for outdoor area, open area shall be done by computer programme as per standard norms for lighting design to meet the specified lux level. Average maintenance factor for outdoor and road lighting: 0.6.</p>	
18.4	<p>Single line diagrams of power distribution upto Lighting Panels. Separate drawing for complete lighting distribution shall also be prepared by vendor.</p>	
18.5	<p>Loads on each phase of LP and LDB with consideration of diversity factor(50%) for sockets.</p>	
18.6	<p>Layout drawings for each indoor area indicating location of luminaires, sockets, fan points, exhaust fans, LDBs and LPs. Details of type of luminaires, source of power supply (AC Normal, AC Emergency and DC Emergency), Bill of Material shall also be covered which shall include unit wise requirements of luminaires and other items.</p>	
18.7	<p>Layout drawings for each outdoor area indicating location of poles / towers, orientation of luminaires, sockets and LPs. Details of pole height / mounting height, type of luminaires, source of power supply (AC Normal, AC Emergency, DC Emergency), Bill of Material shall also be covered for various types of luminaires.</p>	
18.8	<p>Conduit layout drawings with wiring and load distribution details as superimposed on the area layout drawings indicated above. Drawings shall include Bill of Material for conduits, wires, cables etc.</p>	
18.9	<p>Wires shall be laid in GI conduits of 20mm dia size (minimum). Filling area of wires in conduit shall not exceed 40% of conduit area. Wiring of AC Normal, AC Emergency and DC services will run in separate conduits. Lighting and receptacles will be fed from separate circuits. No two different phase circuits will be run in same conduit. However, different circuit of same phase may be laid in the same conduit. A maximum of 20 fittings per circuit will be connected to one phase. At least two sub circuits shall be used for illumination of a particular area. Sub circuit loading of each lighting panel shall be restricted to 2000 Watts.</p>	
19	<p>Cables shall run in cable trays. Conduit is not applicable for the portion where cables are used.</p>	
20	<p>Master Bill of Material (to be submitted at regular intervals of engineering progress) including all items required for the complete lighting system viz. lighting fixtures, lamps, Lighting DBs, Welding DBs, lighting panels, conduits, PVC wires, cables etc.</p>	
21	<p>Lighting panels shall have 20% spare outgoing feeders. AC NLP (with timer for outdoor LP) shall have 6/12/18 outgoing feeders as per the loading requirement of the area where LP is installed. Steel LP shall have 6 outgoing feeders.</p>	
22	<p>The vendor shall guarantee satisfactory performance of the equipment supplied under all conditions and requirement as laid down by this specification.</p>	
23	<p>LED modules and drivers shall be compatible to each other. The LED module driver's ratings and makes shall be as recommended by corresponding LED chip manufacturer. LED Drivers shall have following control &amp; protections:Open Circuit Protection, Suitable precision current control of LED, Short Circuit Protection, Over Temperature Protection, Overload Protection and Surge Protection.</p>	


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24	<p>The individual lamp wattage for LED shall be upto 3 watt. Fractional wattage LEDs are also acceptable. The LED chip efficacy shall be min 120 Lm/W. The luminaire efficacy shall be not less than 90 Lm/W. Suitable heat sink shall be designed &amp; provided in the luminaire. The LED used in the luminaires shall have colour rendering index (CRI) of Min 80. Colour designation of LED shall be "cool day light" (min 5700K) type for indoor areas. However for outdoor areas, the colour temperature of LED shall be min. 4000K, including rough &amp; dust prone areas. LED shall conform to the LM 80 requirements. The max. junction temperature of LED shall be 85 deg C. Further the lumen maintenance at this temperature shall be min 90%. The THD of LED Luminaires shall be less than 10%. Further the EMC shall be as per IS 14700, The power factor of the luminaire shall not be less than 0.9. The marking on luminaire &amp; safety requirements of luminaire shall be as per IS standards. Suitable heat sink with proper thermal management shall be designed &amp; provided in the luminaire.</p> <p>The connecting wires used inside the system, shall be low smoke halogen free, fire retardant type and fuse protection shall be provided in input side specifically for LED luminaire.</p> <p>Care shall be taken in the design that there is no water stagnation anywhere in the housing of the luminaire. The entire housing shall be dust and water proof protection as per IS 12063.</p>	
25	<p>The lighting fixtures in the plant area shall be group controlled from lighting panel. The lighting fixtures in office areas, control rooms etc. shall be controlled by switches. Each switch shall control a maximum of three fluorescent fixtures.</p>	
26	<p>LED Luminaires shall be used for the lighting of all the indoor &amp; outdoor areas. However, for hazardous areas lighting etc, conventional type or LED luminaires shall be used. In false ceiling area LED luminaires shall be recessed mounting type &amp; in non-false ceiling area the LED luminaires shall be surface mounting type. Any special cable required for the same shall be in the supplier scope.</p>	
27	<p>Occupancy based passive infra-red sensors The sensors shall be recess mounted, programmable type suitable for lighting load of 6A with variable off delay settings. The detection area shall be minimum 5 metres for standard room height of 3mt. All the calibrated settings shall be stored in non-volatile memory of PIR sensor which shall be unaffected by power supply fluctuations. Necessary 16A contactor shall be supplied along with each sensor &amp; shall be located inside the switch box. Occupancy sensors shall be provided in conference rooms, meeting rooms (if any such room is shown as per layout drawings).</p>	
28	<p>Lighting system will be provided with AC normal, AC emergency and DC as listed against various areas.            The sources of power lighting are as below:            (i) 415V AC Normal (ACN) Supply from lighting distribution boards / switchboard MCCs            (ii) 415V AC Emergency (ACE) Supply from Emergency Board            (iii) 220V DC Supply from DC Distribution Board            (iv) DC lighting is to be provided, through self-contained DC fixtures with four hours back-up duration, at strategic locations, in auxiliary/offsite buildings wherever DC lighting is not available. The fixtures shall be switched 'ON' automatically in case of failure of AC supply. For main plant area normally all AC luminaries will be in service on normal AC supply. Approximately distribution of AC Luminaries on AC normal and AC emergency shall be as below:            AC Normal (ACN) supply: 80%            AC Emergency (ACE) supply: 20%</p> <p>For Average lux level and type of fixtures please refer to Compliance drawings            For lighting and LV service to be provided in different areas please refer to performance guarantees</p>	
29	<p>Receptacles boxes shall be fabricated out of MS sheet of 2mm thickness and hot dipped gavanised or of die-cast aluminium alloy of thickness not less than 2,5 mm. The boxes shall be provided with two nos. earthing terminals, gasket to achieve IP55 degree of protection, terminal blocks for loop-in loop-out for cable of specified sizes, mounting brackets suitable for surface mounting on wall/column/structure, gland plate etc. The ON-OFF switch shall be rotary type heavy duty, double break, AC23 category, suitable for AC supply. Plug and Socket shall be shrouded Die-cast aluminium. Socket shall be provided with lid safety cover. Robust mechanical interlock shall be provided such that the switch can be put ON only when the plug is fully engaged and plug can be withdrawn only when the switch is in OFF position. Also cover can be opened only when the switch is in OFF position. Wiring shall be carried out with 1100 V grade PVC insulated stranded aluminium/copper wire of adequate size. The Terminal blocks shall be of 1100 V grade. The Terminal blocks shall be of 1100 V grade made up of unbreakable polyimide with adequate current rating and size. The welding receptacles shall be provided with RCCB/RCD of 30mA sensitivity having facility for manual testing/checking of operation of RCCB/RCD.</p>	
30	<p>(i) Decorative receptacle:            At least 01 number 6/16A, 6-Pin, 240V AC decorative socket with switch will be provided in control room, office area, store room, cabin etc. In office area, suitable number of decorative socket with switch to be provided for IT requirements.</p> <p>(ii) Industrial receptacle:            At least 01 number 20A, 3-Pin, 240V AC industrial type receptacles with switch will be provided at suitable location in industrial area. All receptacles will be controlled with a switch.</p>	


	<p style="text-align: center;">TECHNICAL SPECIFICATION LIGHTING FIXTURES, LAMPS &amp; MISC. ITEMS 3X660 MW NTPC BARH STPP STAGE I FGD</p>	<p>PE-TS-442-558-E001</p> <hr/> <p>Issue No: 01</p> <hr/> <p>Rev. No. 00</p> <hr/> <p>Date : 17.05.2024</p>
31	<p>(iii) Welding receptacle:63A, 3-phase, 415V AC welding receptacles with isolating switch will be provided at specific points near all major equipment and at an average distance of 50m (location will be decided during detailed engineering). Maximum 03 nos. receptacles will be fed through one feeder. The welding receptacles shall be provided with RCCB/RCD of 30mA sensitivity having facility for manual testing/ checking of operation of RCCB/RCD.</p>	
32	<p>For items other than fixtures, bidder to furnish test certificates/conformance certificate during detailed engineering.</p>	
33	<p>Glands &amp; lugs for JB's for cables shall be in bidder scope.</p>	
34	<p>Rubber components used in the gland shall be of neoprene. Name / trade name of manufacturer, type no. and applicable range of outer diameter of cable shall be engraved / indelibly printed on the cable gland</p>	
35	<p>All equipment shall be supplied with the power and control cable lugs of suitable size, whether specifically mentioned or not. Name / trade name and size of lug shall be engraved/ indelibly printed on each cable lug.</p>	
36	<p>Containers adequate for storing 100% of P.O. quantity material at site are to be supplied. Vendor shall furnish suitable justification to purchaser during detailed engineering for the number and size of containers being supplied. Materials like Concrete Blocks of Paved surface required for installation and placing of container shall be made available by BHEL. Other supporting material like Rails etc. shall be part of Container only.</p>	
37	<p>Packing slip &amp; holder: Packing slip kept in polyethylene bag shall be placed inside the container at appropriate place. One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface the container.</p>	


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<b>TECHNICAL DATA - PART - A</b>				
<b>SL.NO</b>		<b>UOM</b>	<b>DETAIL</b>	
1.00	<b>DESIGN CODES &amp; STANDARDS</b>			
1.1	Code of practice for interior illumination		IS 3646	
1.2	Code of practice for industrial lighting		IS 6665	
1.3	Code of practice for lighting of public thoroughfare		IS 1944	
1.4	Luminaires.		IS 10322	
1.5	General Lighting. LEDs & LED Modules Terms and definitions		IS 16101	
1.6	Self-Ballasted LED lamps for General Lighting Services: Safety requirement.		IS 16102-1	
1.7	Self-Ballasted LED lamps for General Lighting Services: Performance requirement		IS 16102-2	
1.8	LED modules for General lighting safety requirements.		IS 16103-1	
1.9	Lamp Control gear.		IS 15885-2	
1.10	A.C. or D.C. supplied Control gear for LED modules		S 16104	
1.11	Method of measurement of Lumen maintenance of solid state (LED) sources		IS 16105	
1.12	Method of electric and photometric measurement of solid state (LED) products		IS 16106	
1.13	Luminaires performance		IS 16107	
1.14	Plugs and socket outlets of rated voltage upto and including 250 volts and rated current upto and including 16 amperes		IS 1293	
1.15	Interlocking switch socket outlet		IS 4160	
1.16	Electric ceiling type fans and regulators		IS 374	
1.17	Recommended practice for hot dip galvanising of iron & steel		IS 2629	
1.18	Method of testing uniformity of coating on zinc coated articles		IS 2603	
1.19	Flexible steel conduits for electrical wiring		IS 3480	
1.20	Scaffolds & ladders - Code of safety		IS: 3696	
1.21	Aluminium extension ladders		IS: 4571	
2.0	<b>DESIGN /SYSTEM PARAMETERS</b>			
2.1	Design ambient temperature	°C	50 °C	
2.2	AC Supply			
2.2.1	Rated voltage	V	415	
2.2.2	Rated frequency	Hz	50	
2.2.3	Voltage variation (permissible)	%	+10% to -10%	
2.2.4	Frequency variation (permissible)	%	+3% to -5%	
2.2.5	Combined voltage & frequency variation	%	10%	
2.2.6	System fault level & duration	KA/sec	9kA for fixture	
2.3	DC Supply			
2.3.1	Rated voltage	V	220	
2.3.2	Voltage variation (permissible)	%	+10% to -15%	
2.4	Lighting Concept: Types of supplies considered (other than AC Normal)			
2.4.1	AC emergency		Applicable	
2.4.2	DC emergency		Applicable	


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<b>3.0 CONSTRUCTION FEATURES</b>			
<b>3.1 Lighting Fixtures</b>			
3.1.1	Lighting Fixture type and description		Total Luminous Flux (Lumen) of Luminaire – Min. Value, Measured Electrical Input Power (Watt) of Luminaire – Max. Value
3.1.1.1	FC06 (LED): Industrial type LED fixture aesthetically designed for Switchgear/ Equipment room/ stair case/ corridors.	Lumen, W	3780 Lumen, 42 W
3.1.1.2	FC30 (LED): Panel type 600mm x600mm decorative LED fixture suitable for recess mounting in false ceiling with integral driver aesthetically designed for Control Room/ Office.	Lumen, W	3780 Lumen, 42 W
3.1.1.3	FC81 (LED): Corrosion proof, totally enclosed type LED fixture with integral driver. Industrial type LED Fixture suitable for Battery rooms	Lumen, W	3780 Lumen, 42 W
3.1.1.4	SB02 (LED): Medium Bay, Industrial type LED fixture with integral driver.	Lumen, W	16920 lumen, 188 W
3.1.1.5	SB03 (LED): High Bay, Industrial type LED fixture with integral driver. (Mounting Height > 10M)	Lumen, W	24750 lumen, 275 W
3.1.1.6	SS62 (LED): Street light, LED fixture with integral driver.	Lumen, W	10080 lumen, 112 W
3.1.1.7	SF63 (LED): Flood light type Heavy duty LED fixture with integral driver.	Lumen, W	16920 lumen, 188 W
3.1.1.8	SW41 (LED): Well glass, Dust proof LED fixture with integral driver	Lumen, W	4680 lumen, 52 W
3.1.1.9	SW42 (LED): Well glass, Dust proof LED fixture with integral driver	Lumen, W	7380 lumen, 82 W
3.1.1.10	FC07 (LED): Industrial type LED fixture suitable for conduit/ surface/ suspended/ column mounting with integral driver. Fixture shall operate at 220 V DC supply. Necessary accessories like DC to AC convertor etc. to be included in fixture, if required.	Lumen, W	1260 Lumen, 14 W
3.1.1.11	FC33 (LED): Decorative, recessed type LED fixture (down lighter) with integral driver. Fixture shall operate at 220 V DC supply. Necessary accessories like DC to AC convertor etc. to be included in fixture, if required.	Lumen, W	1260 Lumen, 14 W
3.1.1.12	FC34 (LED): Bulkhead type LED fixture suitable for column mounting with integral driver. Fixture shall operate at 220 V DC supply. Necessary accessories like DC to AC convertor etc. to be included in fixture, if required.	Lumen, W	1260 Lumen, 14 W
b	Type of false ceiling for recessed LED luminaire		Grid False ceiling (600mm X 600mm) (for Control Room).
c	Degree of protection for luminaires		Outdoor: Min IP65 and weather Proof Indoor: Surface / pendant mounting :IP54 Recess mounting (false ceiling): IP20.
d	Hazardous area classification of flameproof/explosion proof lighting fixtures		Zone-2, Group IIA/IIB/IIC
e	Type of LED Lamps		Cool Daylight
<b>3.2 Emergency Lighting Unit</b>			
a	Lamp type		LED
b	Nos. of Lamp		2
c	Lamp wattage	W	6
d	Type of battery		Ni-Cd
e	Battery voltage	V	9
f	Battery backup time	Hrs	4
g	In-built charger		YES

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<b>3.3</b>	<b>Exit Sign</b>		
a	Lamp type		LED
b	Nos. of Lamp		1
c	Lamp wattage	W	12
d	Type of battery		Ni-Cd
e	Battery backup time	Hrs	0.5
<b>3.4</b>	<b>Junction Box (other than Street Light Junction box)</b>		
a	Type of terminals		Four (4) way stud type
b	Size of wire for termination	mm <sup>2</sup>	Shall be for terminating upto 2 nos. 1.5 mm <sup>2</sup> copper wire on each terminal
c	Size of cable for termination (from JB to fixture)	mm <sup>2</sup>	1.5 sq. mm (Cu), PVC insulated, Unsheathed, Stranded copper conductor wire
d	Type of installation		Suitable for outdoor installations
e	Enclosure material		Fire retardant material for indoor application . Thermoplastic / thermosetting / FRP type
f	Enclosure thickness	mm	3 mm
g	Degree of protection		IP-55 for indoor & IPW-55 for outdoor
<b>3.5</b>	<b>Industrial/ Welding Receptacle</b>		
a	Enclosure material		MS sheet & hot dip galvanised / Die cast aluminium alloy / CRCA sheet steel with electrostatic powder coating
b	Enclosure thickness	mm	2 mm (min) for MS sheet & hot dip galvanized / 2.5 mm (min) for die cast aluminium alloy / 2 mm (min) for CRCA sheet steel with electrostatic power coating
c	Process of galvanization		Hot dip galvanized
d	Weight of zinc (Thickness)	g/m <sup>2</sup> (micron)	460 g/m <sup>2</sup> (65 micron)
e	Degree of protection		IP-55
f	other details		
a	Single Phase (20A) Industrial receptacle-RA		20A, 240V, 1-phase, 2 pole, 3-pin (third pin scrapping earth) porcelain, metal clad socket with a metallic cover tied to it
i	Switch		Rotary, heavy duty 20A switch conforming to applicable standard
ii	Plug		Shrouded, die-cast aluminium plug
iii	Interlock		It shall be combined interlocked weather proof industrial unit
iv	Mechanical interlock		(i) Switch can be put ON only when plug is fully engaged. (ii) Plug can be withdrawn only when switch is in OFF position. (iii) Cover can be opened only when switch is in OFF position.
v	Water protection		The arrangement should ensure that water does not enter the plug when socket is ON
vi	Loop-in loop-out terminals		Loop-in loop-out terminals shall be provided inside the box suitable for 4 mm <sup>2</sup> Cu wire.

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b	Three Phase (63A) Welding receptacle-RC		63A, 415V, 3-phase-neutral earth, metal clad socket with cover
i	Switch		Rotary, heavy duty 63A switch conforming to applicable standard.
ii	Plug		Shrouded, die-cast aluminium plug
iii	Interlock		It shall be combined, interlocked weather proof industrial unit.
iv	Mechanical interlock		same as that are applicable for RA type receptacles
v	Cable Size		The receptacle boxes shall be suitable for entry and exit of 3.5CX70 mm <sup>2</sup>
vi	Loop-in loop-out terminals		Al conductor PVC cable and loop-in loop-out terminals for the same shall be provided such that not more than one core is terminated at one terminal. Removable, undrilled cable gland plate shall be provided. Tinned copper lugs and double compression cable glands shall also be supplied by the bidder.
vii	Protection		RCCB/RCD of 30mA sensitivity having facility for manual testing/checking of operation of RCCB/RCD
<b>3.6</b>	<b>Decorative Receptacle</b>		
a	Enclosure material		CRCA sheet steel
b	Enclosure thickness	mm	2 mm
c	Surface treatment		Galvanized
d	Process of galvanization		Hot dip galvanized
e	Weight of zinc (Thickness)	g/m <sup>2</sup> (micron)	460 g/m <sup>2</sup> (65 micron)
f	Degree of protection		IP-20
g	other details		(i) Combination of 6A & 16A, 240V, 1-phase, 2 pole, 6-pin, third pin grounded socket with integral piano key type 16A switch, flush mounted on decorative bakelite (6 mm thick)/ perspex (3 mm thick) sheet as cover of the boxes. (ii) Loop-in loop-out terminals similar to type RA shall be provided. These will be located in office areas.
<b>3.7</b>	<b>Switch Box</b>		Modular Type switches to be provided
a	Enclosure material		Galvanized MS Sheet.
b	Enclosure thickness	mm	1.6mm MS sheet with 3mm thick decorative, Perspex cover.
c	Degree of protection		IP-20
d	Switchboard types		(i) Type SWB1 - Switch board with 2 no. 5A switch, JB type SW1. (ii) Type SWB2 - 3 nos. 5A switches, 1 No. 5A socket, JB type SW2. (iii) Type SWB3 - 5 nos. 5A switches, 1 No. 5 A Socket, 1 No. fan regulator, JB type SW3. (space provision shall be kept for fan regulator in switch boxes) (iv) Type SWB4 - 7 nos. 5A switches, 1 No. 5A Socket, 3 nos. fan regulator, JB type SW4.(space provision shall be kept for fan regulator in switch boxes)  JB-SW1/2/3/4 Provided with stud type terminals including spare terminal, each terminal suitable for terminating upto two nos. of 1.5 mm <sup>2</sup> copper wires.

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<b>3.8</b>	<b>Flexible conduit</b>		
a	Type		Water proof and rust proof made of Heat resistant TERNE coated steel
b	Size	mm	20 mm dia
c	Standard length	M	25 to 50 M
<b>3.9</b>	<b>Cable Glands</b>		<b>By vendor for all incoming and outgoing cables/wires</b>
a	Type		Double compression
b	Material		Brass
c	Nickel Plating provided		YES
d	Flameproof glands with flameproof equipment		YES
<b>3.10</b>	<b>Cable Lugs</b>		<b>By vendor for all incoming and outgoing cables/wires</b>
a	Type		Crimping type/ ring type
b	Material		Tinned copper
<b>3.11</b>	<b>LADDERS</b>		
a	Type		Both (Free standing and Wheel Mounted)
b	Material		Aluminium
c	Duty		Medium
d	Surface treatment		Galvanized
<b>3.12</b>	<b>CEILING FAN</b>		
a	Type		Copper wound single phase motor, aerodynamically designed well balanced Aluminium blades (3 nos.), down rod, die cast Aluminium housing, capacitor, suspension hook, canopies etc.
b	Finishing		Finished in stove enamelled white or with electro static powder coating
c	Power factor		min. 0.9 (except for hazardous and flameproof areas)
d	Voltage		240V +/- 10%, 50Hz, AC
e	Insulation		Class 'E' or better
f	Sweep		1200MM sweep with Stepped electronic regulator
<b>4.0</b>	<b>PERFORMANCE PARAMETERS</b>		
4.1	Vendor shall ensure satisfactory performance for lighting system designed by them at site. In the event of non satisfactory performance i.e. if the desired lux levels are not demonstrated at site, bidder shall supply (free supply without any cost to BHEL) additional lighting fixtures to achieve the desired lux levels as per specification requirement		
<b>5.0</b>	<b>INSPECTION/TESTING</b>		
5.1	As per standard Quality Plan (000-0-999-QOE-S-062) (enclosed with technical specification)		
<b>5.2</b>	<b>TYPE TEST</b>		
5.2.1	All equipment to be supplied shall be of type tested design. During detailed 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 <b>26.02.2018</b> . 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.		
5.2.2	However, if the contractor is not able to submit report of the type test(s) conducted within last ten years from <b>26.02.2018</b> , 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.		

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5.2.3	The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and "No design Change". Minor changes if any shall be highlighted on the endorsement sheet.	
5.2.4	LED Fixtures type test reports to be submitted for one rating each of following type of LED Fixtures: 1. High Bay Fixture 2. Well glass fixture 3. Street Light Fixture 4. Surface mounted type fixture 5. Recessed mounted type fixture	
5.2.5	All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.	
5.2.6	Selection of samples for Type test, acceptance test, routine tests and acceptance criteria for all the items shall be as per relevant IS.	
5.2.7	Type test reports for LED as per standards for following shall be submitted for Approval: 1. Visual and Dimension check 2. Proof of procurement of LEDs 3. Safety tests a) Marking b) Construction c) Provision for Earthing d) External and Internal wiring e) Protection against electrical shock f) Endurance and Thermal g) Insulation resistance & electrical strength h) Resistance to heat fire & tracking i) Resistance to Humidity 4. Fire Retardant test 5. Performance tests (electrical, Photometric color and Life) 6. Burn-in Test 7. Power Cycling 8. Temperature rise test 9. Emission Tests a) Radiated & conducted emission b) Harmonics & flickers 10. Immunity tests	
5.2.8	In addition, following test reports to be submitted for LED chip/LED luminaire: a) LED parameters like Lumen per watt, CRI, Beam angle from manufacturer b) LM 80/IS: 16105 report. c) LM 79/IS: 16106 report.	

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**1.0 SCOPE:**

The purpose of this design document is to cover basic approach for designing lighting system for FGD system area under PEM scope. The document covers various types of lighting system, lighting system design, illumination levels for various areas, luminaries type and low voltage power services for various areas of the FGD system package.

Lighting system for following area shall be designed by BHEL-PEM.

S.no	Building/ area description	No of Buildings	Remarks
1	FGD Control Room Building (FGDCR)	1	
2	Ball Mill Building [BMB] (Limes tone grinding house)	1	
3	Gypsum Dewatering building [GDWB]	1	
4	RC pump + Oxidation Blower house (RCPH)	2	
5	SO2 Analyzer room	2	
6	ACW/DMCW Pump House	1	
7	Road lighting (PEM scope)	-----	Road length shall be considered as per layout.
8	FGD Compressor House + Electrical Annex	1	

Lighting system of buildings/areas not listed in above table shall be designed by BHEL- ISG.


Reference documents:

1. Contract specification.
2. IS 3646-1992 Code of practice for interior illumination.
3. Indian building code.

**1.1 LIST OF APPLICABLE STANDARD:**

Lighting Fixtures and Accessories:

- IS:1913 General and safety requirements for luminaries.
- IS:2148 Flame proof enclosures of electrical apparatus.
- IS:418 Tungsten filament general service electric lamps.
- IS:1258 Bayonet lamp holders.
- IS:1534 Ballast for fluorescent lamps.
- IS:1569 Capacitors for use in tubular fluorescent, high pressure mercury vapour and low pressure sodium vapour discharge lamp circuit.
- IS:1777 Industrial luminaire with metal reflectors.
- IS:2215 Starters for fluorescent lamps.
- IS:2418 Tubular fluorescent lamps for general lighting services.
- IS:3323 Bi-pin lamp holders for tubular fluorescent lamps.
- IS:3324 Holders for starters for tubular fluorescent lamps.
- IS:4013 Dust-tight electric lighting fittings.
- IS:8224 Electric Lighting fittings for Division 2 areas.
- IS:10276 Edison screw lamp holders.
- IS:10322 Luminaires.

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- IS:13021 AC Supplied Electronic Ballasts for tubular fluorescent lamps.

#### Lighting Panels, Switch-boxes, Receptacles and Junction Boxes:

- IS:2147 Degree of protection provided by enclosures for low-voltage switchgear and control gear.
- IS:1293 Plugs & socket outlets of rated voltage up to and Including 250volts & rated current up to and including 16 Amps.
- IS:2551 Danger notice plates.
- IS:13947 Low voltage switchgear and control gear
- IS:3854 Switches for domestic and similar purposes.
- IS:6875 Control switches (switching devices for control and auxiliary circuits including contactor relays) for voltages upto and including 1000 V AC and 1200 V DC.
- IS:13703 Low voltage fuses for voltages not exceeding 1000V AC or 1500 V DC.

#### Conduits, Pipes and Accessories


- IS:2667 Fittings for rigid steel conduit for electrical wiring.
- IS:3837 Accessories for rigid steel conduits for electrical wiring.
- IS:9537 Conduits for electrical installations.

#### Lighting Wires/Cables

- IS:694 PVC insulated cables for working voltages upto and including 1100 V
- IS:3961 Recommended current ratings for cables. (PVC Insulated and PVC sheathed heavy duty cables and light duty cables).
- IS:8130 Conductors for insulated electric cables and flexible cords.
- IS:10810 Methods of tests for cables.

#### LED Luminaries

- IS: 16101:2012 General Lighting. LEDs and LED modules Terms and definitions
- IS:16102(Part 1):2012 Self Ballasted LED Lamps for General Lighting Services. Part-1 Safety Requirements.
- IS:16102(Part 2):2012 Self Ballasted LED Lamps for General Lighting Services. Part-2 Performance Requirements.
- IS:16103(Part I):2012 LED modules for General Lighting Safety Requirements.
- IS:15885 (Part 2/Sec. 13):2012 Lamp control gear Part 2 particular Requirements Section 13 d.c. or a.c. Supplied Electronic control gear for LED modules.
- IS: 16104:2012 d.c. or a.c. Supplied Electronic control gear for LED modules – Performance Requirements.
- IS: 16105:2012 Method of Measurement of Lumen maintenance of Solid-state Light (LED) Sources.
- IS: 16106:2012 Method of Electrical and photometric Measurements of Solid State Lighting (LED) Products
- IS: 16107:2012 Luminaires Performance
- IS: 16108:2012 Photobiological safety of Lamps and Lamp Systems
- IS 513 Cold rolled low carbon steel sheets and strips
- IS 12063 Classification of degree of protection provided by enclosures.
- IS 14700 Electromagnetic compatibility (EMC) – Limits (Part 3/Sec. 2) for Harmonic current emission – THD < 15% (equipment, input current < 16 Amps. per phase.

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- IS 9000 (Part 6) Environment testing: Test Z – AD: composite temperature/humidity cyclic test.
- IS 15885 Lamp control gear: particular requirements for (Part 2/Sec. 13) DC or AC supplied electronic control gear IS 16004 – 1 and 2) for LED modules.
- IS 4905 Method for random sampling

#### Electrical Installation Practices & Miscellaneous


- IS:1944 Code of practice for lighting of public thorough fare
  - IS:3646 Code of practice for interior illumination.
  - IS:5572 Classification of Hazardous areas (other than Mines) having flammable gases and Vapours for electrical installation
  - IS:6665 Code of practice for industrial lighting.
- National Electrical Code  
Indian Electricity Rules.  
Indian Electricity Act
- IS:5 Colour for ready mixed paints & enamels.
  - IS:280 Mild steel wires for general engineering purposes.
  - IS:374 Electric ceiling type fans & regulators.
  - IS:732 Code of practice for electrical wiring installations.
  - IS:1255 Code of practice for installation and maintenance of power cables Upto and including 33KV rating.
  - IS:2062 Steel for general structural purposes
  - IS:2629 Recommended practice for hot-dip galvanizing of iron and steel.
  - IS:2633 Methods for testing uniformity of coating of zinc coated articles.
  - IS:2713 Tubular steel poles for overhead power lines.
  - IS:3043 Code of practice for earthing
  - IS:5216 Guide for safety procedures and practices in electrical work.
  - IS:5571 Guide for selection of electrical equipment for hazardous areas.
  - BS:6121 Mechanical cable glands

## **2.0 LIGHTING SYSTEM DESIGN:**

2.1 The illumination system shall be designed to ensure uniform, reliable, aesthetically pleasing and glare free illumination. The lighting fixtures shall be designed for minimum glare. The design shall prevent glare/luminous patch seen on VDU/ Large video screens, when viewed from an angle. The finish of the fixtures shall be such that no bright spots are produced either by direct light source or by reflection. The diffusers/ louvers used in fixtures shall be made of impact resistant polystyrene sheet and shall have no yellowing property over a prolonged period. The Lux levels to be adopted for various area are indicated at Annexure - A.

2.2 All fixtures shall be of a proven design for applications in power plant environment.

LED Luminaires shall be used for the lighting of all the indoor & outdoor areas. However, for DC lighting, hazardous areas lighting etc. conventional type luminaires shall be used. In false ceiling area LED luminaires shall be recessed mounting type & in non-false ceiling area the LED luminaires shall be surface mounting type.

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The individual lamp wattage for LED shall be upto 3 watt. Fractional wattage LEDs can also be provided. The LED chip efficacy shall be min 120 Lm/W. The luminaire efficacy shall be not less than 80 Lm/W. Suitable heat sink shall be designed & provided in the luminaire. The LED used in the luminaires shall have colour rendering index (CRI) of Min 80. Colour designation of LED shall be "cool day light" (min 5700K) type for indoor areas. However, for outdoor areas, the colour temperature of LED shall be min. 4000K, including rough & dust prone areas. LED shall conform to the LM 80 requirements.

The max. junction temperature of LED shall be 85 deg. C. Further the lumen maintenance at this temperature shall be min 90%. The THD of LED Luminaires shall be less than 10%. Further the EMC shall be as per IS 14700. The power factor of the luminaire shall not be less than 0.9. The marking on luminaire & safety requirements of luminaire shall be as per IS standards. Suitable heat sink with proper thermal management shall be designed & provided in the luminaire.

LED drivers shall have following control & protection:

- (i) Suitable precision current control of LED
- (ii) Open circuit protection
- (iii) Short circuit protection
- (iv) Over temperature protection
- (v) Overload protection

2.3 The lighting fixtures in the plant area shall be group controlled from lighting panel. The lighting fixtures in office areas, control rooms etc. shall be controlled by switches.

2.4 Lighting panel (LP) for controlling lights with additional provision for manual/bypass control shall be provided:

Indoor lighting panel: With Timer

Outdoor lighting panel: With Timer or photocell

2.5 Outdoor areas shall have flood light fixtures mounted on flood light poles.

2.6 Degree of protection:


(i) All outdoor fixtures shall be weather proof and of min. IP65 class of protection.

(ii) For Indoor type of fixtures:

- (a) Surface/Pendent mounting: - IP 54 class of protection.
- (b) Recess Mounting (False ceiling): - IP 20 class of protection

2.7 Junction box for indoor lighting shall be made of fire retardant material. Material of JB shall be thermoplastic or thermosetting or FRP type.

Junction boxes for street lighting poles and lighting mast shall be deep drawn or fabricated type made of min 1.6mm thick CRCA sheet, hot dip galvanized min 50micron thick. The degree of protection shall be IP 55.

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### 3.0 ILLUMINATION DESIGN CALCULATION:

3.1 Lighting design for indoor areas shall be done by computer programme as per standard norms for lighting design to meet the specified lux level.

The Reflection factor (RF) will be considered as given below:

	Ceiling (rc)	Wall (rw)	Floor (rf)
White and very light colours	70	70	10
Light colours	50	50	10
Middle tints	30	30	10
Dark colours	10	10	10

Values of Maintenance Factor (MF), which includes the luminaire depreciation factor, will be considered as given below:

Dust prone indoor/outdoor area	0.6
Control room & air conditioned area	0.8
Indoor area non-AC (except fluorescent fixture)	0.7
Conveyor / Transfer point	0.5

3.2 Lighting design for outdoor area, open area shall be done by computer programme as per standard norms for lighting design to meet the specified lux level.

### 4.0 LIGHTING SYSTEM DESCRIPTION

Lighting system will be provided with AC normal, AC emergency and DC emergency as listed against various areas as per Annexure-B enclosed.


The sources of power lighting are as below:

- (i) 415V AC Normal (ACN) Supply from lighting distribution boards / switchboard MCCs
- (ii) 415V AC Emergency (ACE) Supply from Emergency Board
- (iii) 220V DC Emergency Supply from DC Distribution Board

#### **For FGD control room:**

For FGD control room area normally all AC luminaries (ACN & ACE) will be in service on normal AC supply. Approximately distribution of AC Luminaries on AC normal and AC emergency shall be as follows: ACE luminaire shall be ON with normal AC supply. However, these lights shall go off for a few seconds in case of normal AC supply failure but shall be automatically restored when emergency AC supply is energised by diesel generator set.

Emergency DC lighting will be provided by emergency DC lighting fixtures located strategically in critical operating area & emergency exits. These shall be switched ON when both the normal AC & emergency AC lighting system fail. The DC supply shall be automatically switched off after about 3 min following the restoration of supply to normal AC or emergency AC lighting system.

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**All other auxiliary area:**

For other auxiliary areas AC Normal lighting will provide 100% illumination level and normally all AC lighting fixture shall remain "ON" as long as normal AC supply is available.

In off-site areas/odd locations, for safe movement of personal during emergency, self-contained 4 hours duration battery operated emergency lighting units (ELUs) is envisaged.

**4.1 AC Normal Lighting Systems:**

AC Normal lighting fixtures are fed through a number of conveniently located AC Lighting panel (ACLP) which are fed from Lighting Distribution Board (LDB).


LDBs consisting of dry type isolation transformer housed in LDB with proper separation from distribution panels as per details indicated below is envisaged:

Transformer rating:	50 / 100 kVA
Transformer voltage ratio:	415 / 433 Volt, taps of +5% to -5% in steps of 2.5%.
Transformer type:	cast resin Non Encapsulated
Distribution Panel type:	Single front fixed type
LDB Configuration:	Two incomer & bus coupler
Incomer & Bus coupler type:	TPN SFU
Incomer & Bus coupler rating:	As per lighting transformer rating
Outgoing feeder type:	TPN SFU
Outgoing feeder rating:	63A

AC normal lighting panel as per details given below is envisaged:

Incomer type:	TPN MCB
Incomer rating:	63A
Outgoing feeder type:	SPN MCB
Outgoing feeder rating:	20A
Short circuit rating:	10kA
ELCB in Incomer:	Yes

The normal LPs shall be provided with contactor & timer for switching the incomer supply.

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Street lighting panel as per details given below is envisaged:

Incomer type:	TPN MCB
Incomer rating:	63A
Outgoing feeder type:	TPN MCB
Outgoing feeder rating:	20A
Short circuit rating:	10kA
ON/ OFF control	With Timer or photocell

AC LDB shall be 3Ph, 4Wire, 50Hz effectively grounded System.

Voltage drop at the fixture from the LDB bus shall not exceed 3%.

Circuit loading of each Lighting panel shall be done in such a way that almost balance loading in all the phases will be achieved.

Minimum two phases will be used for Illumination of a particular area.


Sub circuit loading of each lighting panel shall be restricted to 2000W or 20 Nos. fixtures whichever is lower.

#### **4.2 AC Emergency Lighting Systems (Only for FGD control room):**

AC Emergency lighting fixtures are fed through a number of conveniently located AC Lighting panel (ACLP) which are fed from AC Emergency Lighting Distribution Board (ELDB).

ELDBs consisting of dry type isolation transformer housed in ELDB with proper separation from distribution panels as per details indicated below is envisaged:

Transformer rating:	50 kVA
Transformer voltage ratio:	415 / 433 Volt, taps of +5% to -5% in steps of 2.5%.
Transformer type:	cast resin Non Encapsulated
Distribution Panel type:	Single front fixed type
LDB Configuration:	Two incomer & bus coupler
Incomer & Bus coupler type:	TPN SFU
Incomer & Bus coupler rating:	As per lighting transformer rating

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Outgoing feeder type: TPN SFU

Outgoing feeder rating: 63A

AC emergency lighting panel as per details given below is envisaged:

Incomer type: TPN MCB

Incomer rating: 63A

Outgoing feeder type: TPN MCB

Outgoing feeder rating: 20A

Short circuit rating: 10kA

ELCB in Incomer: Yes

AC ELDB shall be 3Ph, 4Wire, 50Hz effectively grounded System.

DC Emergency lighting fixtures fed through suitable numbers of conveniently located DC Emergency Lighting panel (DCELP) which are fed through DC emergency Lighting Distribution Board (DCELDB).

#### 4.3 DC Emergency Lighting Systems:

DCELDBs as per details given below is envisaged:

Distribution Panel type: Single front fixed type

DC Incomer type: DP Switch fuse unit with contactor

DC Incomer rating: 63A

Outgoing feeder type: DP Switch fuse unit

Outgoing feeder rating: 32A

DCELPs as per details given below is envisaged:


Incomer type: DP Switch fuse unit

Incomer rating: 32A

Outgoing feeder type: DP MCB

Outgoing feeder rating: 20A

DC lighting fixtures shall be provided at strategic locations in the FGD Control Room to enable safe movement of operating personnel and access to important control points during an emergency, when both the normal AC & Emergency lighting system fail.

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Lighting fixtures shall be fed from DC lighting panels which in turn shall be fed from DC LDB.

4.4 The LDBs shall be made of CRCA sheet steel of 2 mm and shall be provided with voltmeter and ammeter along with selector switch, supply ON indicating lamps etc. All indicating lamps will be cluster LED type. The DOP for LDB will be IP-54 for indoor and for transformer cubicle IP-42. Whereas the DOP for LP will be IP-55 for indoor and IP-55 with canopy for outdoor. Lighting distribution boards & panels shall be powder coated with colour shade RAL9002.

#### 4.5 Emergency EXIT lamps:

Emergency exit lamps backed up by battery shall be provided at strategic locations of the building for safe exit of personnel. These exit lamps will remain ON all the time and normally received power supply from ACELP.

Exit lamp unit shall contain maintenance free Ni-Cd battery with 0.5 hours backup capacity.

#### 5.0 STREET LIGHTING / OUTDOOR LIGHTING

5.1 The roads within BHEL scope as per contract will be considered for lighting.

5.2 Street lights / outdoor lighting will be fed from separate panel located at suitable places. Automatic switching ON/OFF of these circuits shall be done from street light panel.

5.3 For street lighting, street light pole will be used. For outdoor area lighting if required flood light pole will be used. Pole type shall be as below:

Pole height (Above Ground):

9 meter (Minimum)



Pole type:

hot dip galvanized (Tubular/Octagonal in shape).

Coating thickness of galvanizing shall be min 70 micron.


The pole shall be mounted above ground using base plate and minimum height of pole shall be 8 meters.

#### 6.0 LOW VOLTAGE POWER SERVICES

6.1 Receptacles shall be controlled through MCB. Mechanical interlock shall be provided for receptacles such that it can be switched "ON" only when the plug is in finally engaged condition and the plug can be withdrawn only when switch is in "OFF" position.

Different type of receptacles as per details below will be provided:

(i) Decorative receptacle:

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At least 01 number 6/16A, 5-Pin, 240V AC universal socket with switch will be provided in control room, office area, store room, cabin etc.

(ii) Industrial receptacle:

Suitable number 20A, 3-Pin, 240V AC industrial type receptacles with switch will be provided at suitable location in industrial area. All receptacles will be controlled with a switch.

(iii) Welding receptacle:

63A, 3-phase, 415V AC welding receptacles with isolating switch and RCCB/RCD of 30mA sensitivity having facility for manual testing/checking of operation of RCCB/RCD will be provided at specific points near all major equipment and at an average distance of 50m (location will be decided during detailed engineering). Maximum 03 nos. receptacles will be fed through one feeder.

6.2 Based on room size, suitable nos. of ceiling fans (1200mm sweep) with Stepped electronic regulator finished in stove enamelled white or with electro static powder coating shall be provided in office rooms/control room which are not covered by air-conditioned system. Power factor of fans shall not be less than 0.9.

## 7.0 WIRING / CONDUITS

7.1 Wiring of lighting system will be done as follows:

(i) Wiring in FGD areas Cable Vaults, transformer yard, outdoor area (like Absorber etc.) will be done using Cu/Al, PVC insulated, FRLS PVC sheathed unarmoured cable which shall be laid in cable tray running in these areas.


For FGD Control room, Switchgear room etc. Wiring installation will be done by multi-stranded, PVC insulated, unsheathed, copper, colour coded wires laid in GI conduits of 20 mm dia size (minimum) conforming to IS-9537. The thickness of conduits up to & including 25 mm dia will be 1.6 mm and conduits above 25 mm will be 2.0 mm. Colour of the PVC insulation of wires shall be Red, Yellow, Blue, black for R, Y, and B phases & neutral respectively and white & grey for DC positive & DC negative circuits respectively.

(ii) Conduits will be heavy-duty type hot dip galvanised steel conforming to IS-9537. Conduit accessories will be hot dip galvanised. In corrosive area, conduits will have suitable epoxy coating additionally.

(iii) Flexible conduits shall be water proof and rust proof made of heat resistant TERNE coated steel.

(iv) Conduits in office rooms, control room, service building, laboratory building and other air-conditioned areas will be surface mounted on the roof above false ceiling. However vertical drops of conduits will be concealed along walls and finally plastered for better aesthetics. Vertical drops along RCC column shall be exposed.

(v) Filling area of wires in conduit shall not exceed 40% of the conduit area.

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(vi) Wiring for AC Normal, AC Emergency, and DC Emergency services will run in separate conduits

(vii) Lighting and receptacles will be fed from separate circuits. No two different phase circuits will be run in the same conduit. However, different circuits of same phase may be laid in the same conduit.


7.2 Following sizes of 1100 V grade, PVC insulated single core stranded copper conductor wires/ PVC insulated Standed 2 Core copper/aluminium conductor cable will be used:

	WIRE	CABLE
Lighting Panel to Fixtures:	1.5 sq. mm (Cu)	1.5 sq. mm (Cu)
Lighting Panel to JB's/ Switches:	1.5 sq. mm (Cu)	1.5 sq. mm (Cu)
JB's/ switches to Fixtures:	1.5 sq. mm (Cu)	1.5 sq. mm (Cu)
Panel to First receptacles:	4 sq. mm (Cu)	10 sq. mm (Al)
First receptacles to looping other receptacles (240V, 1 phase receptacles):	4 sq. mm (Cu)	10 sq. mm (Al)
In case of only one receptacles in ckt., Panel to receptacles (240V, 1 phase receptacles):	4 sq. mm (Cu)	10 sq. mm (Al)
Panel/ JB's to flood light fixtures:		2-1C-1.5 sq. mm (Cu)


## 8.0 EARTHING

Earthing of lighting system will be done by using of following sizes of wire / flat:


Lighting Distribution Board:	GS Flat 50x6 mm
Lighting Panels:	GS Flat 25x6 mm
Lighting fixtures, receptacles, conduits, junction boxes & switch boxes, power sockets:	14 SWG GI wire
Welding receptacles:	GS Flat 25x6 mm
Street light pole/ flood light pole:	GS Flat 50x6 mm
Electrode for Pole earthing:	2 nos, 40 mm dia MS rod, 3 mtr long

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ANNEXURE-A			
AVERAGE LUX LEVEL & TYPE OF FIXTURES			
S. No.	LOCATION	AVERAGE LUX LEVEL	TYPE OF FIXTURE
1	Switchgear rooms, charger, rectifier room	200	Industrial type LED Luminaire
2	Control room, computer room, control equipment room	350	LED Luminaire equivalent to Mirror optics with anti-glare features or down lighter.
3	Offices, conference room etc.	300	Decorative mirror optics Type LED luminaire or LED down lighter
4	Battery rooms	100	Totally enclosed corrosion proof LED luminaire
5	Transformer area	20 (general) 50 (on equipment)	LED luminaire
6	Diesel generating room/enclosure, compressor room, pump house etc.	150	LED medium bay/Industrial type LED Luminaire
7	Cable galleries/vault	50	Industrial type LED Luminaire
8	Street lighting- Primary roads Secondary roads	20 10	LED street lights
9	Outdoor storage handling and unloading area	20	LED Luminaire

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ANNEXURE-B								
LIGHTING & LV POWER SERVICES IN DIFFERENT AREAS								
S. No.	AREA	ACN	ACE	DCE	6/16A Socket	20A Socket	63A Socket	ELU \$
1	FGD control room	Y (70%)	Y (30%)	Y	Y	-	-	
2	Cable spreader room/vault	Y (80%)	Y (20%)	Y	-	Y	Y	
3.	BALL MILL BUILDING (BMB) LIME STONE GRINDING BUILDING HOUSE	Y (100%)	-	-	-	Y	Y	Y
4	RC pump+ OXIDATION BLOWER House (RCPH)/Compressor House	Y (100%)	-	-	-	Y	Y	Y
5	GYPSUM DEWATERING BUILDING (GDWB)	Y (100%)	-	-	-	Y	Y	Y
6	SO2 ANALYZER ROOM	Y (100%)	-	-	-	Y	Y	Y
7	ACW/DMCW PUMP HOUSE	Y (100%)	-	-	-	Y	Y	Y
8	Area lighting	Y (100%)	-	-	-	-	-	-
9	Street lighting	Y (100%)	-	-	-	-	-	
<b>LEGEND:</b>	ACN:	AC Normal Lighting						
	ACE:	AC Emergency Lighting						
	DCE:	DC Emergency Lighting						
	Y:	YES						
	\$:	Emergency Lighting Unit (ELU) & 6/16A Switch socket for ELU						

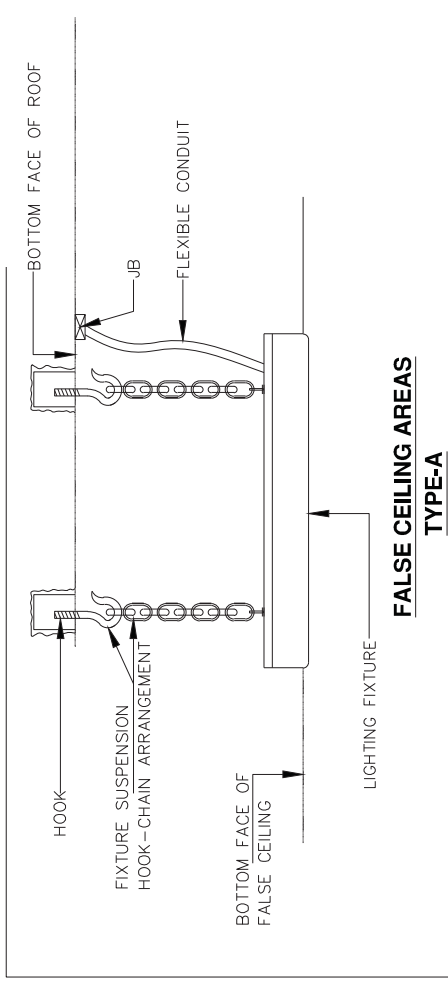
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	<b>3X660 MW NTPC BARH STPP STAGE I FGD</b>			Issue No: 01
				Rev. No. 00
				Date : 17.05.2024
<b>TECHNICAL DATA - PART - B (SUPPLIER DATA TO BE FURNISHED ALONG WITH THE OFFER)</b>				
S. No.	DESCRIPTION	LUMINAIRE MAKE AND MODEL	MEASURED ELECTRICAL INPUT POWER	TOTAL LUMINOUS FLUX (LUMEN) OF LUMINAIRE -
	MAIN SUPPLY ITEMS		(W) MAX. VALUE	(LUMEN) MIN. VALUE
1	Lighting Luminaires			
1.1	Luminaire Type FC06 (LED)			
1.2	Luminaire Type FC30 (LED)			
1.3	Luminaire Type FC81 (LED)			
1.4	Luminaire Type SB02 (LED)			
1.5	Luminaire Type SB03 (LED)			
1.6	Luminaire Type SS62 (LED)			
1.7	Luminaire Type SF63 (LED)			
1.8	Luminaire Type SW41 (LED)			
1.9	Luminaire Type SW42 (LED)			
1.10	Luminaire Type FC07 (LED)-DC			
1.11	Luminaire Type FC33 (LED) -DC			
1.12	Luminaire Type FC34 (LED)			

NOTE: THE ABOVE LIST IS INDICATIVE, ALL LIGHTING FIXTURES AS PER INDENT BOQ SHALL BE INCLUDED IN THE DATA SHEET-B

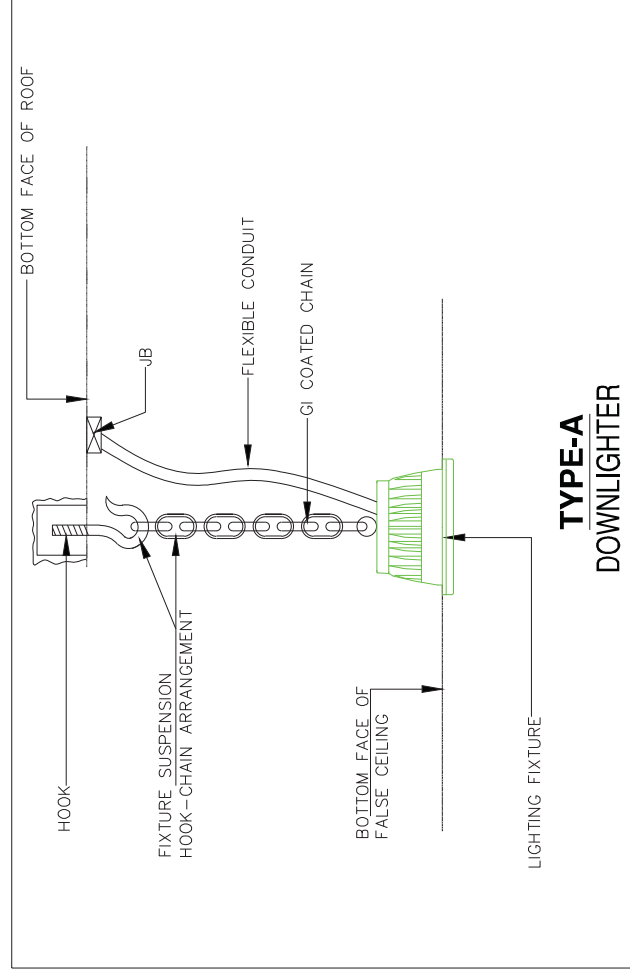
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		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

**COMPLIANCE DRAWING**

ANNEXURE-1 TYPICAL MOUNTING ARRANGEMENT

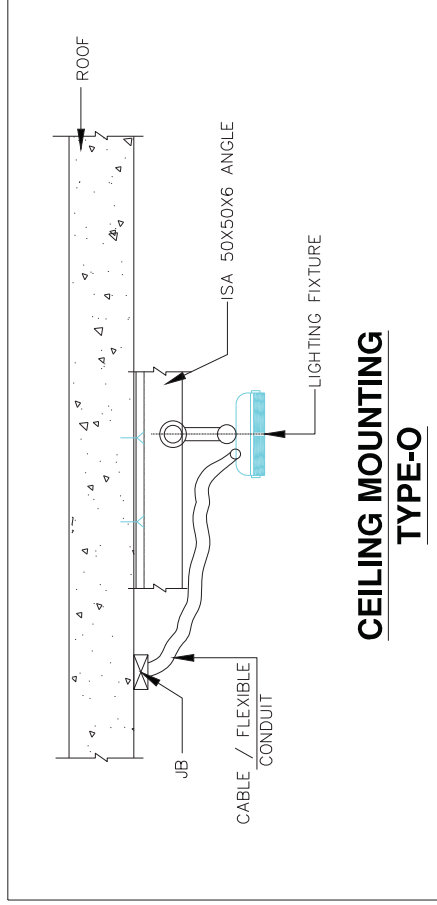


This is a Typical mounting arrangement dwgs/ details for guidance only. Final Mounting arrangement dwg shall be made by the successful bidder during detailed Engineering. It is to be noted that GI Conduit 20mm Dia and Flexible PVC Coated Conduit, Structural Steel shall be provided by BHEL. Balance all other accessories clamps/ chains/ clips/ steel rope/ pins etc required for mounting as per typical mounting arrangement for their fixtures shall be part of fixtures only and shall be provided by the Bidders.

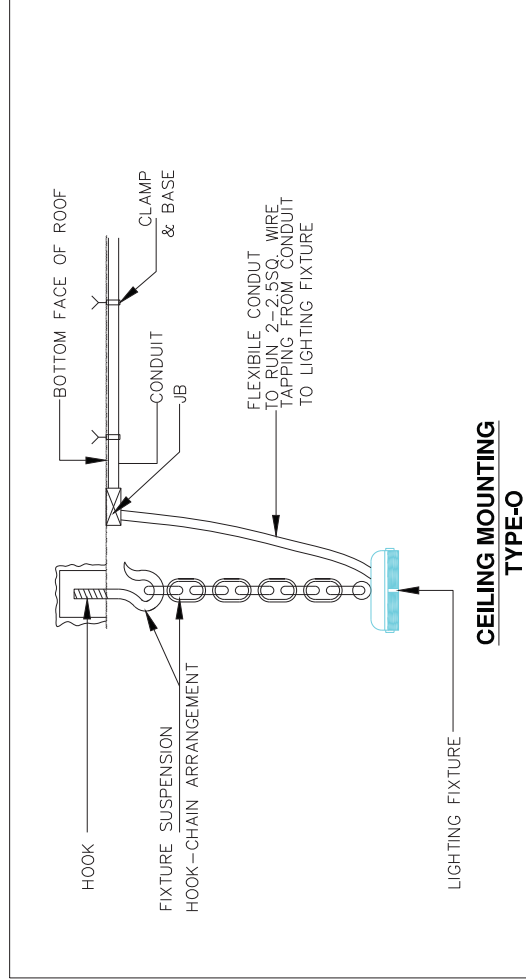


2. In Lighting layout Mounting arrangement also shown. If any Discrepancy found on both drawings then Consult with Design Incharge/Site Incharge.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BHEL site incharge.
5. All structural steel parts/supporting parts shall be hot dip galvanized as per BCO/TS.

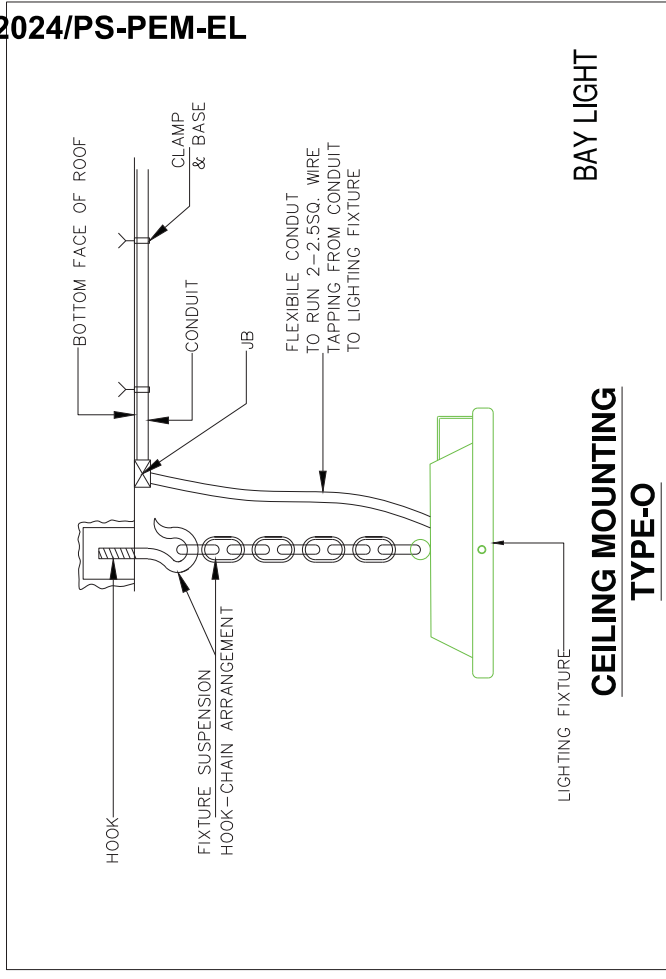
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**CEILING MOUNTING  
TYPE-O**



**CEILING MOUNTING  
TYPE-O**

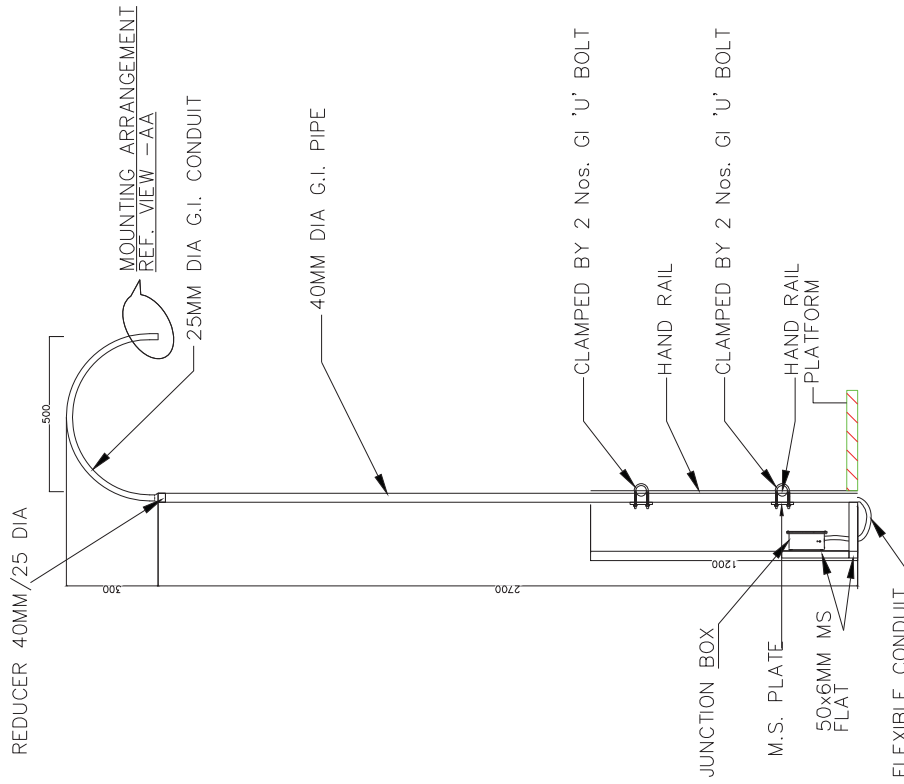


**CEILING MOUNTING  
TYPE-O**

**BAY LIGHT**

**General Notes:**

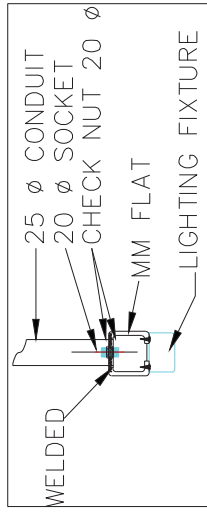
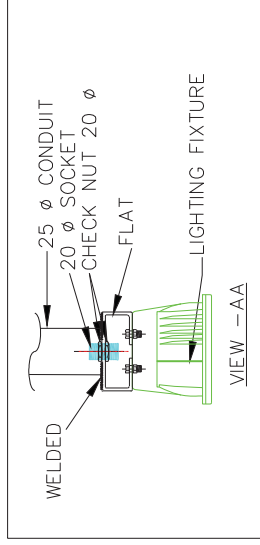
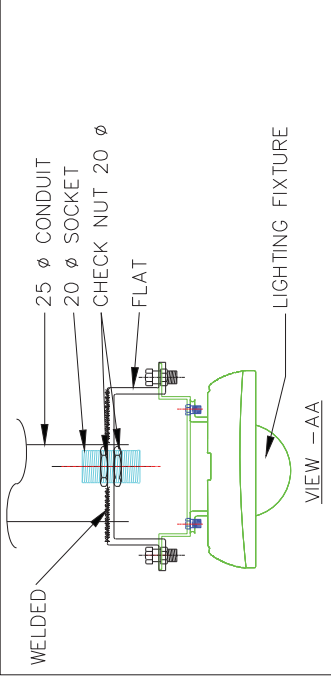
1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting layout, Mounting arrangement also shown, if any Discrepancy found on both documents then consult with Design Incharge/Site Incharge.
3. Quantity of Material indicated in drawings indicate only estimated quantity.
4. If any new type of mounting required at site then optimized design shall be provided.
5. All structural steel parts/supporting parts shall be hot dip galvanized as per B00/75.

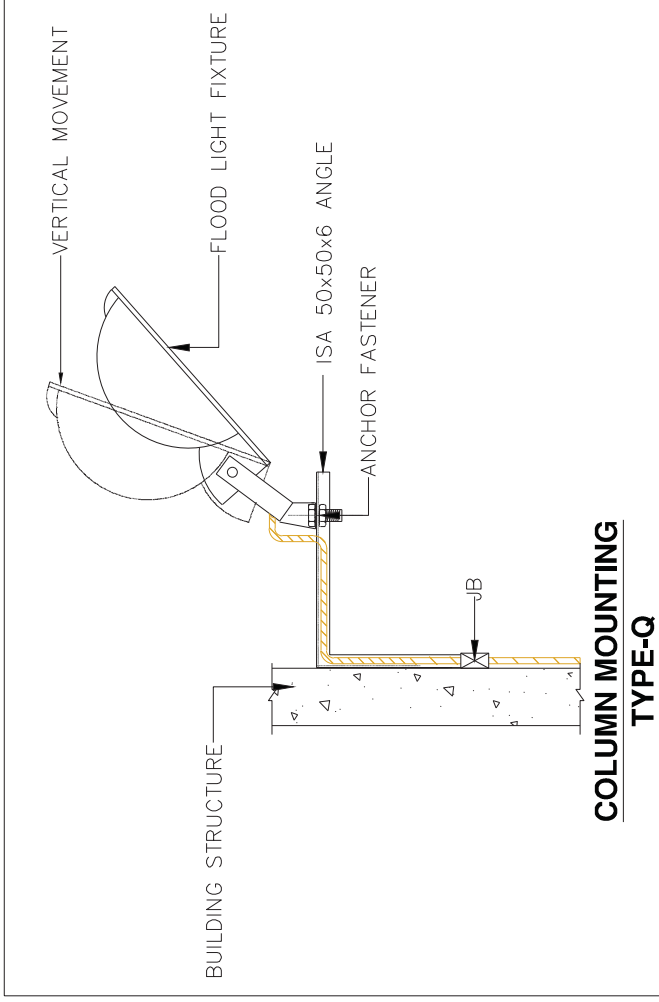
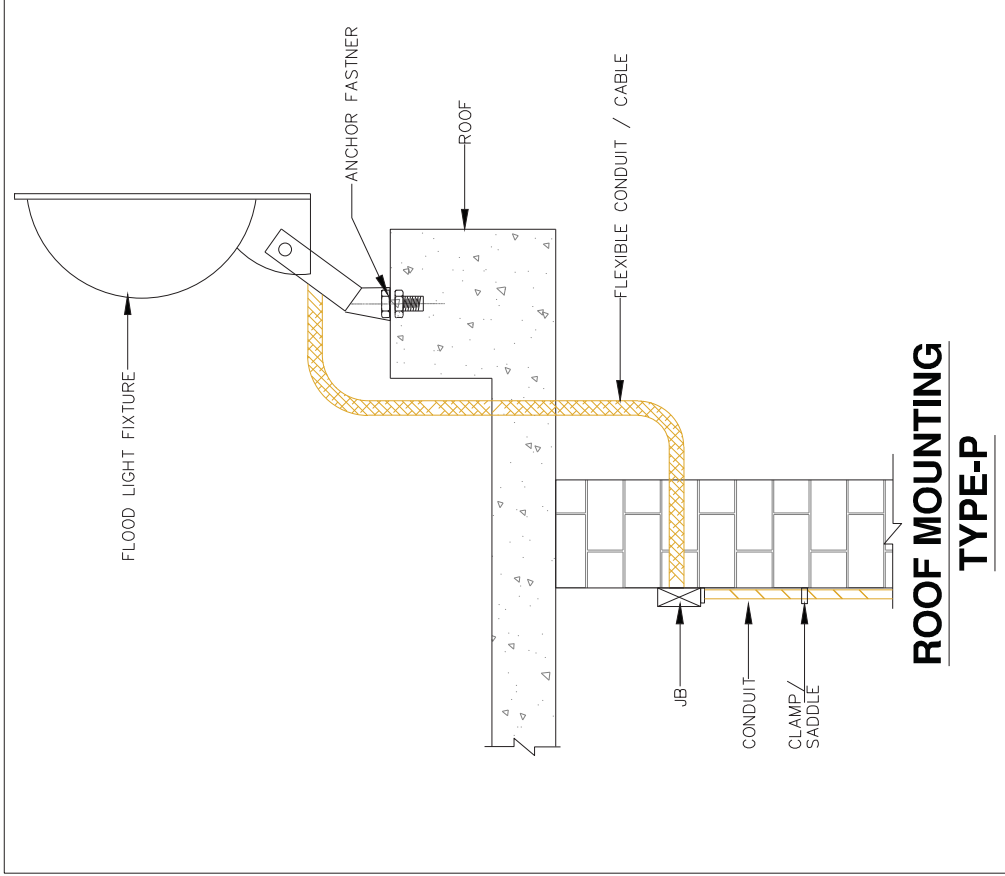


# HAND RAIL MOUNTING TYPE-I

**General Notes:**

1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting type mounting, the design shall show if discrepancy found on both sides of the Conduit with Design and/or Site.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BHEL site incharge.
5. All structural steel parts/supporting parts shall be hot dip galvanized as per BQ0/TS.

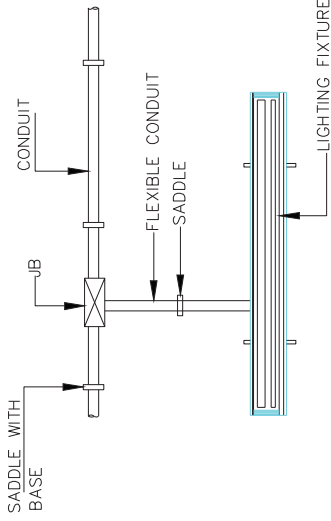




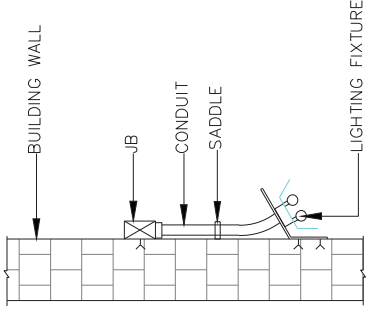
- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
  2. In Lighting type drawings, the mounting details shown are for reference only. In case of any discrepancy found on both drawings, the Contract with Design shall prevail.
  3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
  4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BH&L site incharge.
  5. All structural steel parts/supporting parts shall be hot dip galvanized as per BOQ/TS.

SIZE-A4

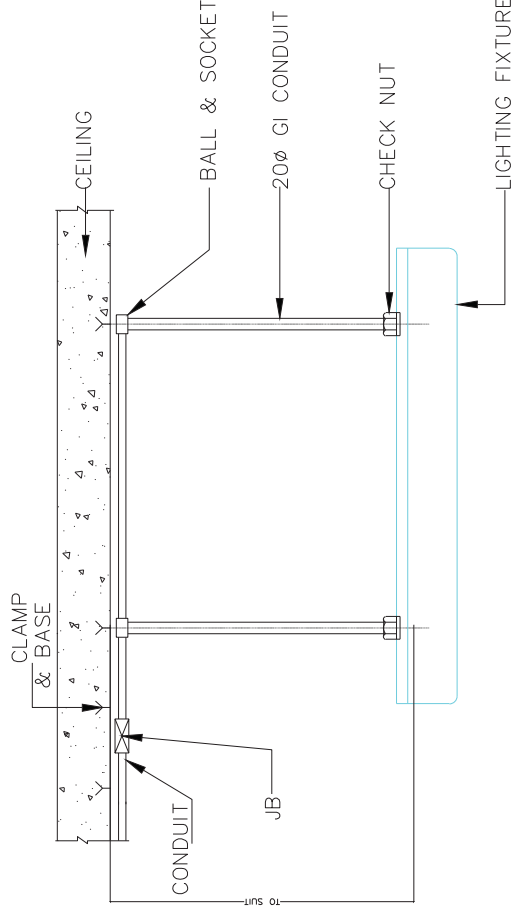
01 02 03 04 05 06 07 08



**TYPICAL MOUNTING DETAIL OF WALL MOUNTED, TYPE-D**



**END VIEW**



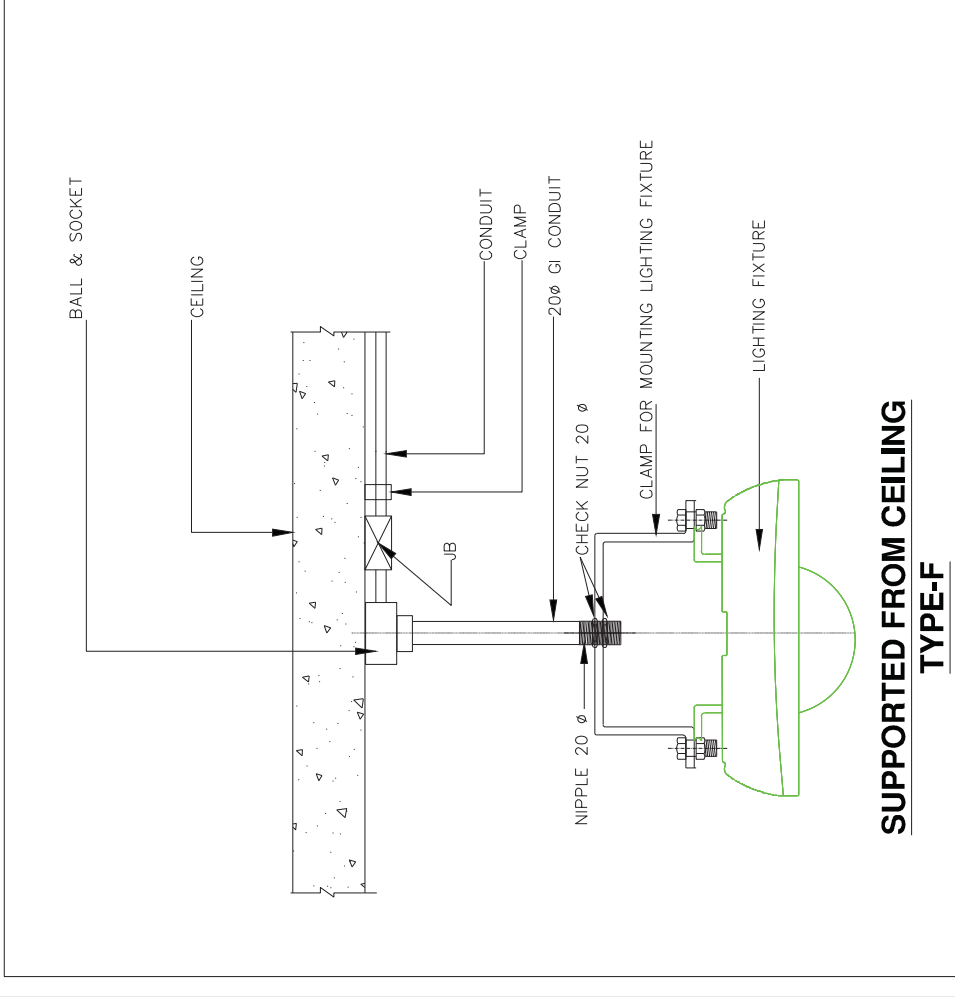
**TYPICAL MOUNTING DETAIL OF SUSPENDED, TYPE C**

SIZE-A4

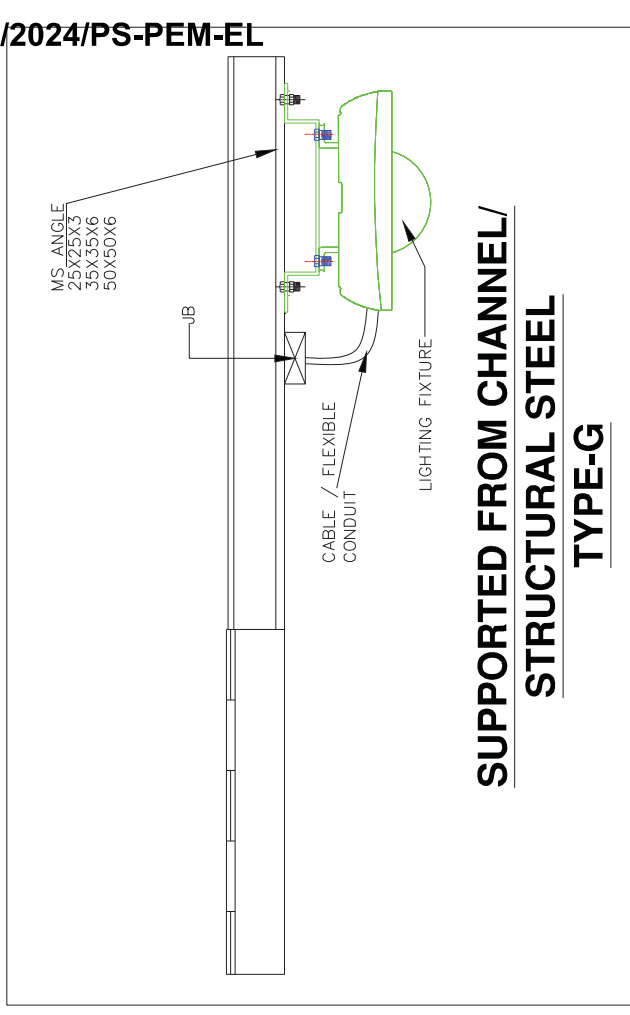
01 02 03 04 05 06 07 08

**General Notes:**

1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting type mounting, the design shall be as per the design shown in the drawing. If any discrepancy found on both drawings, the Contractor shall refer to the Design and Detailing of the site.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BHEL site incharge.
5. All structural steel parts/supporting parts shall be hot dip galvanized as per BCOQ/TS.



**SUPPORTED FROM CEILING  
TYPE-F**



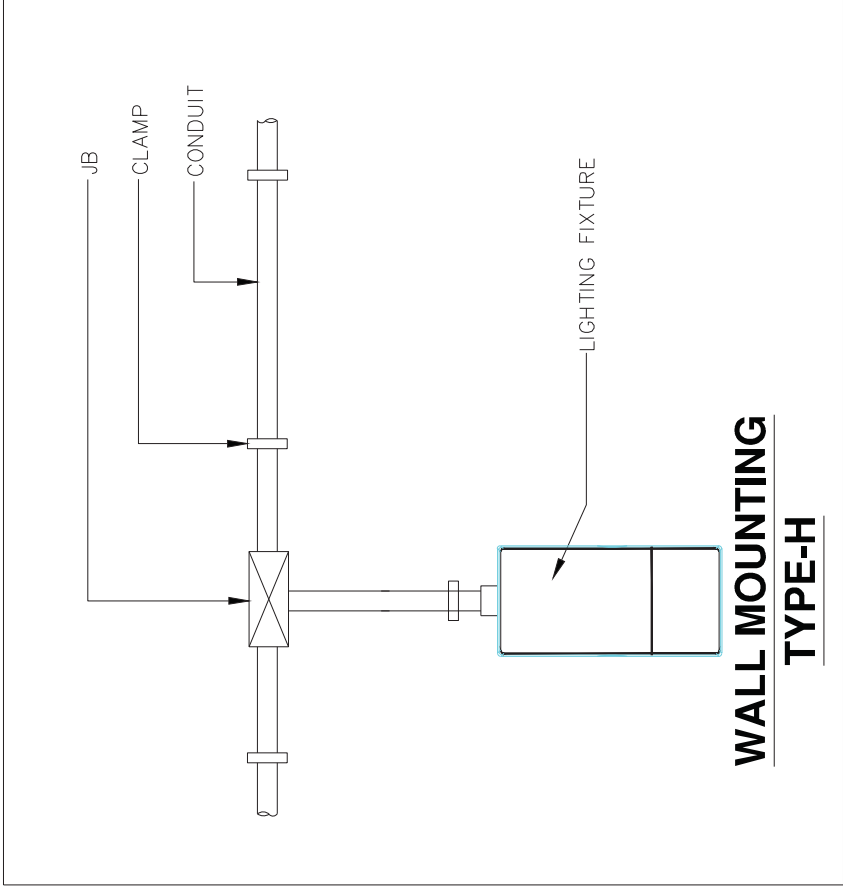
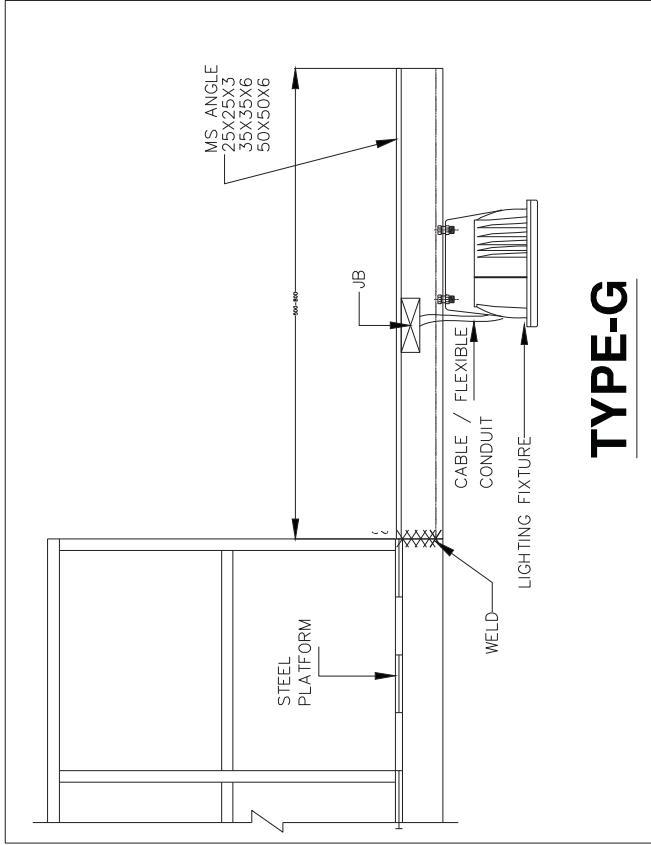
**SUPPORTED FROM CHANNEL/  
STRUCTURAL STEEL  
TYPE-G**

- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
  2. In Lighting type drawings, the quantity and size of parts, discrepancy found on both drawings, the Contractor will Design and provide. Site
  3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
  4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BHEL site incharge.
  5. All structural steel parts/supporting parts shall be hot dip galvanized as per BCOQ/TS.

SIZE-A4

01 02 03 04 05 06 07 08

H G F E D C B A



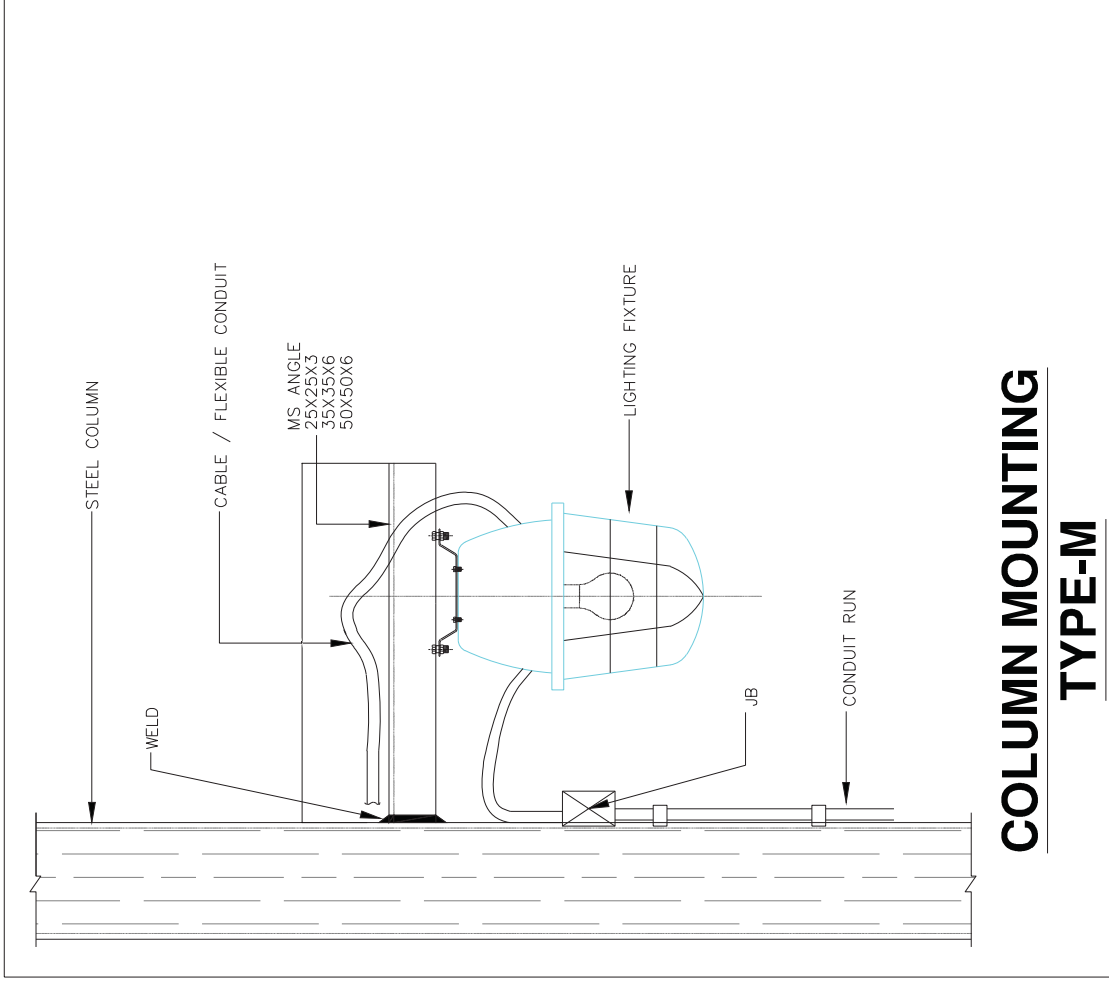
SIZE-A4

01 02 03 04 05 06 07 08

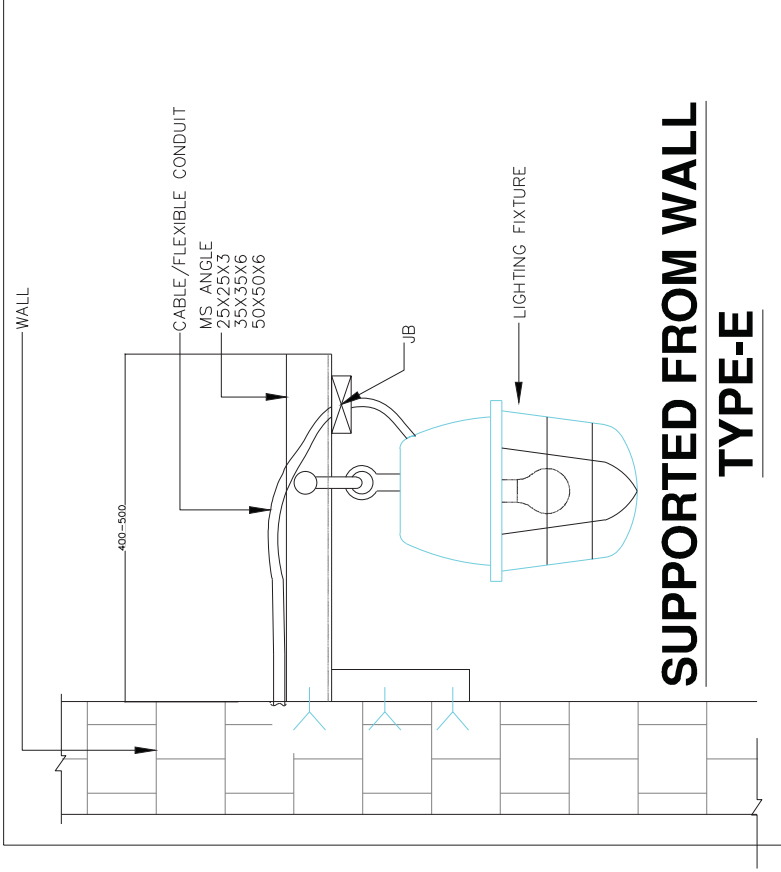
H G F E D C B A

General Notes:

1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting type mounting, the design shall show the discrepancy found on both drawings, the Contractor with Design shall agree on site.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BHEL site incharge.
5. All structural steel parts/supporting parts shall be hot dip galvanized as per BCOQ/TS.



## COLUMN MOUNTING TYPE-M

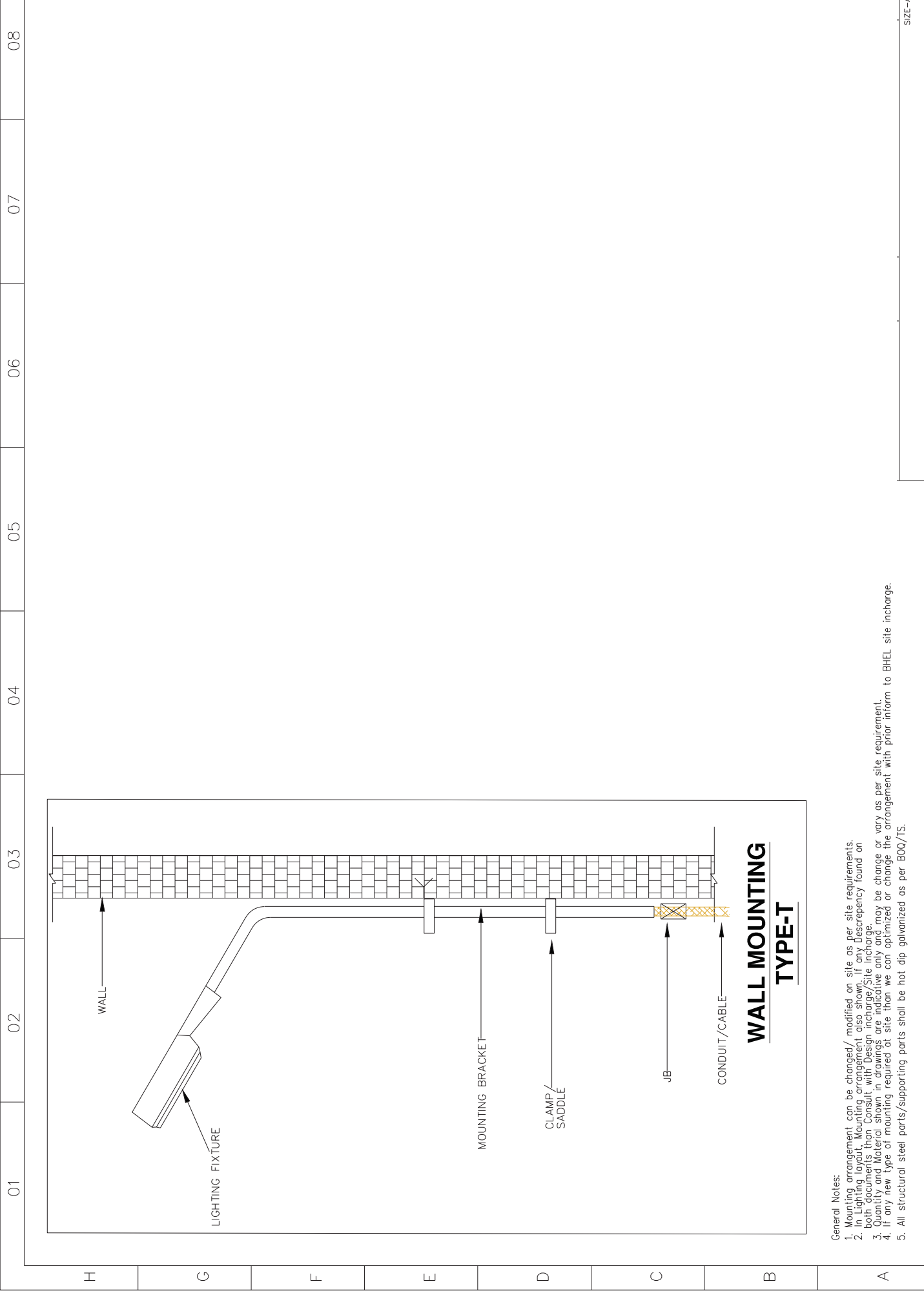


## SUPPORTED FROM WALL TYPE-E

**General Notes:**

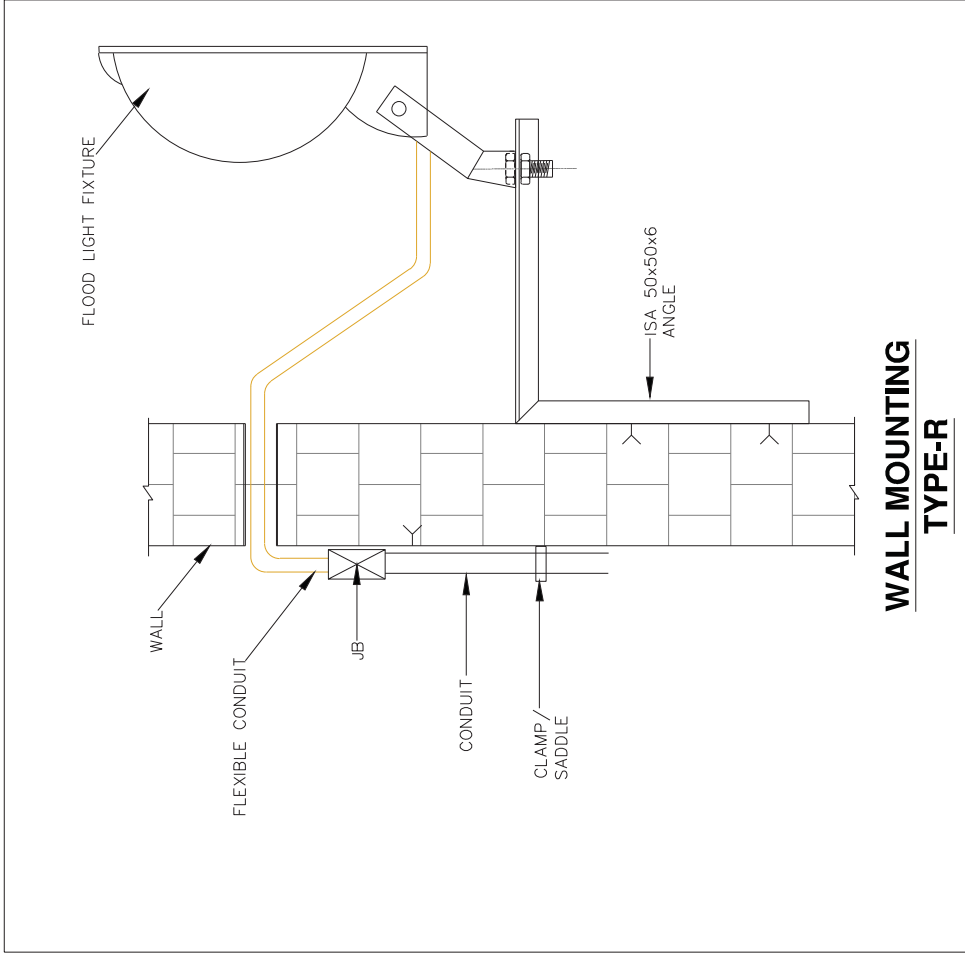
1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting layout, Mounting arrangement also shown, if any Discrepancy found on both documents than Consult with Design Incharge/Site Incharge.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BHEL site incharge.
5. All structural steel parts/supporting parts shall be not dip galvanized as per BQO/TS.

SIZE-A4



- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
  2. In Lighting layout, Mounting arrangement also shown, if any Discrepancy found on both documents than Consult with Design Incharge/Site Incharge.
  3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
  4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BH&EL site incharge.
  5. All structural steel parts/supporting parts shall be hot dip galvanized as per BOQ/TS.

SIZE-A4



**WALL MOUNTING  
TYPE-R**

- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
  2. In Lighting layout, Mounting arrangement also shown, if any Discrepancy found on both documents than Consult with Design Incharge/Site Incharge.
  3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
  4. If any new type of mounting required at site than we can optimized or change the arrangement with prior inform to BH&EL site incharge.
  5. All structural steel parts/supporting parts shall be hot dip galvanized as per BOQ/TS.

SIZE-A4

	<b>TECHNICAL SPECIFICATION</b> <b>LIGHTING FIXTURES, LAMPS &amp; MISC. ITEMS</b> <b>3X660 MW NTPC BARH STPP STAGE I FGD</b>	PE-TS-442-558-E001
		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

## PERFORMANCE GUARANTEES TO BE DEMONSTRATED AT SITE

ANNEXURE-A			
AVERAGE LUX LEVEL & TYPE OF FIXTURES			
S. No.	LOCATION	AVERAGE LUX LEVEL	TYPE OF FIXTURE
1	Switchgear rooms, charger, rectifier room	200	Industrial type LED Luminaire
2	Control room, computer room, control equipment room	350	LED Luminaire equivalent to Mirror optics with anti-glare features or down lighter.
3	Offices, conference room etc.	300	Decorative mirror optics Type LED luminaire or LED down lighter
4	Battery rooms	100	Totally enclosed corrosion proof LED luminaire
5	Transformer area	20 (general) 50 (on equipment)	LED luminaire
6	Diesel generating room/enclosure, compressor room, pump house etc.	150	LED medium bay/Industrial type LED Luminaire
7	Cable galleries/vault	50	Industrial type LED Luminaire
8	Street lighting- Primary roads Secondary roads	20 10	LED street lights
9	Outdoor storage handling and unloading area	20	LED Luminaire

	<b>TECHNICAL SPECIFICATION</b> <b>LIGHTING FIXTURES, LAMPS &amp; MISC. ITEMS</b> <b>3X660 MW NTPC BARH STPP STAGE I FGD</b>	PE-TS-442-558-E001
		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

REQUIREMENT OF LIGHTING AND LV POWER SERVICES OF VARIOUS AREAS AS APPLICABLE FOR THE PROJECT ARE TO BE SPECIFIED HERE/ sample sheet is shown below:

ANNEXURE-B								
LIGHTING & LV POWER SERVICES IN DIFFERENT AREAS								
S. No.	AREA	ACN	ACE	DCE	6/16A Socket	20A Socket	63A Socket	ELU \$
1	FGD control room	Y (70%)	Y (30%)	Y	Y	-	-	
2	Cable spreader room/vault	Y (80%)	Y (20%)	Y	-	Y	Y	
3.	BALL MILL BUILDING (BMB) LIME STONE GRINDING BUILDING HOUSE	Y (100%)	-	-	-	Y	Y	Y
4	RC pump+ OXIDATION BLOWER House (RCPH)/Compressor House	Y (100%)	-	-	-	Y	Y	Y
5	GYPSUM DEWATERING BUILDING (GDWB)	Y (100%)	-	-	-	Y	Y	Y
6	SO2 ANALYZER ROOM	Y (100%)	-	-	-	Y	Y	Y
7	ACW/DMCW PUMP HOUSE	Y (100%)	-	-	-	Y	Y	Y
8	Area lighting	Y (100%)	-	-	-	-	-	-
9	Street lighting	Y (100%)	-	-	-	-	-	
<b>LEGEND:</b>	ACN:	AC Normal Lighting						
	ACE:	AC Emergency Lighting						
	DCE:	DC Emergency Lighting						
	Y:	YES						
	\$:	Emergency Lighting Unit (ELU) & 6/16A Switch socket for ELU						

	TECHNICAL SPECIFICATION LIGHTING FIXTURES, LAMPS & MISC. ITEMS 3X660 MW NTPC BARH STPP STAGE II FGD	PE-TS-442-558-E001
		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

## QUALITY PLAN

COMPONENT & OPERATIONS		ITEM : LIGHTING FIXTURES (Conventional and LED type)		STANDARD QUALITY PLAN				DP NO: 2000999-Q0F-S-462		REVIEWED BY		APPROVED BY	
		CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTITY OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	A	C	N	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14
LED type Lighting fixture													
Bought out items / in-process checks													
LED Chip	LED chip efficacy	Major	Visual	Mfr Std	Mfr Std	NTPC Spec Appd. Data sheet/ LM 80 report	NTPC Spec/ Appd Data sheet	LM 80 report	✓	✓	✓		At the time of final inspection
	LED chip CRI and CCT	Major	Visual	Mfr Std	Mfr Std	NTPC Spec Appd. Data sheet/ LM 80 report	NTPC Spec/ Appd Data sheet	LM 80 report	✓	✓	✓		At the time of final inspection
	Reported TM21 (L80) lifetime of LED chip	Major	Visual	Mfr Std	Mfr Std	NTPC Spec Appd. Data sheet/ LM 80 report	NTPC Spec/ Appd Data sheet	LM 80 report	✓	✓	✓		At the time of final inspection
LED Driver	a Compatibility with LED module/chip, controls & protection features as per NTPC spec	Major	Visual	-	-	NTPC spec requirements	Certificate of compliance by LED driver manufacturer / lighting fixture supplier that driver meets all NTPC specification requirements	Certificate of compliance	✓	✓	✓		
	b THD and pf check	Major	Electrical	Mfr std.	-	NTPC specification	THD < 13% and pf >= 0.9	Inspection report	✓	-	-		P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
Castings	Freedom from defects	Major	Visual	Mfr std	-	NTPC specification requirements	Castings shall be free from any defects such as blow holes, surface blisters, cracks and cavities etc.	Inspection report	✓	-	-		P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
Sheet metal forming and lubrication	Freedom from defects	Major	Visual	Mfr std	-	NTPC specification requirements	sheet metal fabrication / forming etc should be as per manufacturer standards and good engg practices	Inspection report	✓	-	-		P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
Pre-treatment and powder coating	Pre-treatment process checks, Powder coating finish, thickness, uniformity of coating and adhesion	major	Visual, chemical & mech	Mfr std	-	Mfr standard, NTPC specification requirements	Nominal coating thickness 50 microns or more	Inspection report	✓	-	-		P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier

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LEGEND \* RECORDS, IDENTIFIED WITH "ICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. \*\* M: MANUFACTURER/ SUB-SUPPLIER; C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS "W".

Format No.: QY-01-QAI-P-10/F3-R0

Engg. Div./QA&I

Sl No		COMPONENT & OPERATIONS	CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS
						6 M	6 ON			9	10	11	12	
B		Acceptance Tests on LED Lighting fixture	a	Major	Visual			lighting fixture supplier to submit the details of lot offered for NTPC inspection (Type of lighting fixtures, their batch number, sub-vendor name, quantity)		List	P	V	V	The list may be used by NTPC for sample selection
			b	Major	Visual			NTPC accepted type test reports (LM80/LM79) report	Certificate of compliance	Certificate of compliance	V	V	V	
			c	Major	Visual	1 sample per type	1 sample per type	NTPC specification and NTPC approved data sheet/drg.	NTPC specification and approved data sheet/drg.	Inspection report	P	W	W	
			e	Major	Mechanical	1 sample per type	1 sample per type	NTPC approved data Sheet	IS 10:22 Part 1	Inspection report	P	W	W	
			f	Major	Optical	Mnfr std.	Mnfr std	NTPC accepted type test reports	Certificate of compliance	Certificate of compliance	P/V*	V	V	P/V* - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
			f	Major	Optical	Mnfr std.	Mnfr std	NTPC accepted type test reports, LM 79, IS 16106, IS 16107	Certificate of compliance for the batch that offered lighting fixture LOR and lighting fixture efficacy is not be less than 90% (refer IS 16107) with reference to type test reports	Certificate of compliance	P/V*	V	V	P/V* - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier

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LEGEND: \* RECORDS, IDENTIFIED WITH "TICK" ( / ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. \*\* M: MANUFACTURER/ SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. CHR: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS "W".

Format No.: QS-01-QAI-P-10/13-R0

Engg. Dir./QA&I

SI No		COMMENT & OPERATIONS		CHARACTERISTICS / INSTRUMENTS		CLASS OF CHECK		TYPE OF CHECK		QUANTUM/ CHECK		REFERENCE DOCUMENT		ACCEPTANCE NORMS		FORMAT OF RECORD		APPROVED BY		
																				CONFORMING TO CODE : As applicable
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Note: Packing shall be witnessed as per Annexure-I to Quality Plan

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LEGEND: \* RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. \*\* M: MANUFACTURER/ SUB-SUPPLIER; C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLDPOINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS 'W'.  
 Format No.: QS-01-CAI-P-10/3-R0 Engg. Dir./QA&I

**PACKING SPECIFICATIONS- LIGHTING FIXTURES, LAMPS & MISC. ITEMS  
ANNEXURE-I**

**PACKING**

1. The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.
2. Lighting Fixtures, Lamps, Receptacles, Switchboards, 24V Supply modules, 24V sockets, Junction Boxes, Exit signs shall be clean and dry prior to packaging.
3. All items specified at sl. No.2 above shall be supplied in packed cartons. The tapes used for packing shall not bleed, leave residue, or damage the item when removed.
4. Fixtures & other lighting material shall be wrapped in weather proof material such as polythene sheets, air bubble sheets/ thermocol etc. The lighting fixtures shall be placed in a corrugated paperboard/ fibreboard container/ mono carton.
5. The mono cartons shall be wrapped or bagged or tied in place in master cartons. The master carton shall be taped and then wrapped with cushioning material.
6. The dimensions of cartons shall be as per manufacturer's recommendations.
7. For items like step ladder, wheel mounted ladder and flexible conduits, packing shall be as per manufacturer standard.

Note: In case Manufacturer has a different packing standard which is **equivalent or better** same to be submitted for approval during contract stage.

	TECHNICAL SPECIFICATION LIGHTING FIXTURES, LAMPS & MISC. ITEMS 3X660 MW NTPC BARH STPP STAGE I FGD	PE-TS-442-558-E001
		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

**SUB VENDOR LIST**

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES11	CABLE GLANDS	1	E1201	ALLIED TRADERS & EXPORTERS	C-124 A, SECTOR-2, NOIDA -201 301, UTTAR PRADESH, INDIA	Mr. Vijay Mohan Sood +(91)-(120)-2525694 +(91)-(120)-3052594 +(91)-(11)-23287156 vijay_mohansood@yahoo.com	
	CABLE GLANDS	2	E1017	ARUP ENGG & FOUNDARY WORKS	391/119,PRINCE ANWAR SHAH ROAD, CALCUTTA-700068	033 2473 0850	
	CABLE GLANDS	3	E1206	BALIGA LIGHTING EQPT.PVT.LTD.	63A,CP RAMASWAMY ROAD, ALWARPET,P.B.No 6910, CHENNAI-600018	44-24995505,22680990-4	
	CABLE GLANDS	4	E1036	COMMET BRASS PRODUCTS	NUTAN CHEMICAL COMPOUND, WALBHAT ROAD, GOREGAON, MUMBAI-400063	91-022-26852961/62/63 comet@vsnl.net	
	CABLE GLANDS	5	DW08	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/ 022-29270878.	
	CABLE GLANDS	6	E1044	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059	91-22-28324829 / 66919034 devang@electromacglands.com	
	CABLE GLANDS	7	I01	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
ES12	CABLE LUGS	1	E1040	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST).	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/	
	CABLE LUGS	2	E1149	UNIVERSAL MACHINES LTD.	4,B.B.D.BAG (EAST) 90,STEPHEN HOUSE,5TH FLR CALCUTTA-700001	033 2282 2540	
ES14	EARTH LEAKAGE CB	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	EARTH LEAKAGE CB	2	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	EARTH LEAKAGE CB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	EARTH LEAKAGE CB	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	EARTH LEAKAGE CB	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	EARTH LEAKAGE CB	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	EARTH LEAKAGE CB	7	E1068	INDO ASIAN	B-24, PHASE - II, NOIDA - 201305, U.P.	120-3042222	
	EARTH LEAKAGE CB	8	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE	011 - 25793021	
	EARTH LEAKAGE CB	9	E1120	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004	044 - 24988056, 044 - 24988057, 044 - 24988058	
ES21	CONTROL SWITCHES/ SELECTOR SWITCH	1	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	CONTROL SWITCHES/ SELECTOR SWITCH	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	CONTROL SWITCHES/ SELECTOR SWITCH	3	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479000	
	CONTROL SWITCHES/ SELECTOR SWITCH	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	CONTROL SWITCHES/ SELECTOR SWITCH	5	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEI-BAVLA ROAD, CHANGODAR,		
	CONTROL SWITCHES/ SELECTOR SWITCH	6	RE05	RECOM PVT. LTD.	M/S RECOM PVT. LTD.,16A , 2ND FLOOR A, WING RAJ INDUSTRIAL COMPLEX, MILITARY	Mr. Chandrashekar Kamath (MD) : 09820249503	
ES22	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	CONTROL TRANSFORMER/ WINDING HEATING 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	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	3	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	4	E1082	LOGICSTAT	B-160, INDUSTRIAL AREA, C BLOCK RD, OKHLA I, OKHLA INDUSTRIAL AREA, NEW DELHI, DL 110020	011 2681 0032	

## SUB-VENDOR DIRECTORY

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	5	E1106	PRECISE ELECTRICALS	47A-49A, CHAKALA ROAD ANDHERI(E), MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	6	E1128	UNILEC ENGINEERS PVT. LTD.	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C., RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	7	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.co m, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	FOR CONTROL TRANSFORM ER ONLY
ES27	EMER. PORTABLE LTG. SET	1	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;	
	EMER. PORTABLE LTG. SET	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	SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
ES28	FUSE BASE	1	E1068	INDO ASIAN	B-24, PHASE - II, NOIDA - 201305, U.P.	120-3042222	
	FUSE BASE	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12- A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI- 600032	044-49681447	
	FUSE BASE	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	FUSE BASE	4	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
	FUSE BASE	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
	FUSE BASE	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	FUSE BASE	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	FUSE BASE	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	FUSE BASE	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	FUSE BASE	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES29	HRC FUSES	1	E1068	INDO ASIAN	B-24, PHASE - II, NOIDA - 201305, U.P.	120-3042222	
	HRC FUSES	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12- A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI- 600032	044-49681447	
	HRC FUSES	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	HRC FUSES	4	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
	HRC FUSES	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
	HRC FUSES	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	HRC FUSES	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	HRC FUSES	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	HRC FUSES	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	HRC FUSES	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	IND.POWER & WLDG SOCKETS	1	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	

## SUB-VENDOR DIRECTORY

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES33	IND.POWER & WLDG SOCKETS	2	E1207	CYCLE ELECTRIC DEVICE & SERV.CO.	: A-3, NEAR ANTHEM BIOSCIENCE, KSSIDC INDUSTRIAL AREA, BOMMASANDRA, BOMMASANDRA INDUSTRIAL AREA, BANGALORE, KARNATAKA 560099	Mr. H.Jaishanker +919845039081, 080 - 27833102, 080 - 27833103 ; +91 80 41460985 'cycloelectric@gmail.com	
	IND.POWER & WLDG SOCKETS	3	B04	BCH	20/4, MATHURA ROAD, FARIDABAD - 121006, HARYANA, INDIA	0(129)-4063000, 9015800189(Ramesh Giri) 'ramesh.giri@bchindia.com	
	IND.POWER & WLDG SOCKETS	4	B02	BEST & CROMPTON	Best & Crompton Engineering Ltd	Ph : +91 44 4551 4724 , MRKT	BEST &
	IND.POWER & WLDG SOCKETS	5	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI - 400705.	Tel : 022 27620299 / 97 / 96 'mail@ajmerna.net	
ES34	INTERPOSING RELAY	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	INTERPOSING RELAY	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	INTERPOSING RELAY	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
	INTERPOSING RELAY	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA	Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com	
	INTERPOSING RELAY	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES35	INDICATING LAMPS	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	INDICATING LAMPS	2	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	6832259,6918834-37	
	INDICATING LAMPS	3	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	INDICATING LAMPS	4	E1153	VAISHNO(HOTLINE SWGR.& CONTROL)	G-19, SECTOR - 11, NOIDA - 201301, UTTAR PRADESH, INDIA	8377805157 9818338922	
	INDICATING LAMPS	5	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12- A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-	9818338922	
	INDICATING LAMPS	6	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	INDICATING LAMPS	7	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	JUNCTION BOXES (NON FLAME PROOF)	1	J01	JASPER ENGINEERS PVT. LTD.	A-23, SECTOR - 8, NOIDA-201301	0120-4033520/533	
	JUNCTION BOXES (NON FLAME PROOF)	2	EC05	Electro Controls & Devices	M/S ELECTRO CONTROLS & DEVICES, F-41, SITE-C, SURAI PUR INDUSTRIAL AREA GREATER NOIDA, UTTAR PRADESH :201308	Mr. Sanjay Sharma (Chief Promoter) 0120-2569487, 2560100,2560300	
	JUNCTION BOXES (NON FLAME PROOF)	3	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD - 382 213	020-026708100	
	JUNCTION BOXES (NON FLAME PROOF)	4	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126	
	JUNCTION BOXES (NON FLAME PROOF)	5	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	
	JUNCTION BOXES (NON FLAME PROOF)	6	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126 contact person : Vishwa bandhu E-mail:d.gupta@pmipl-online.com ;admin@pmipl-	
	JUNCTION BOXES (NON FLAME PROOF)	7	MK01	MIKA ENGINEERS	BRANCH OFFICE : 'D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi Email: asgar@mikaengineers.com  E-mail : mika@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell - 099230 74373	TYPE-S ONLY

## SUB-VENDOR DIRECTORY

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES36	JUNCTION BOXES (NON FLAME PROOF)	8	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	TEL.- +912066745000 Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126 contact person : Vishwa bandhu E-mail:d.gupta@pmipl-online.com ;admin@pmipl-online.com	
	JUNCTION BOXES (NON FLAME PROOF)	9	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;	
	JUNCTION BOXES (NON FLAME PROOF)	10	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI – 400705.	Tel : 022 27620299 / 97 / 96 'mail@ajmerna.net	
	JUNCTION BOXES (NON FLAME PROOF)	11	S802	S.B. ELECTRICAL ENGINEERING CORPORATION	03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002	022- 22069831; 022-66637259	
	JUNCTION BOXES (NON FLAME PROOF)	12	RT13	RITTAL INDIA PVT. LTD.	Espire Building ,Level -1 A-41, Mohan Co-Operative Industrial Estate ,Mathura Road, New Delhi -110044	Amit Bansal Phone: 011-42004000, D: 011-42004033 - Mobile: +91 9717772245 - mailto:amit.b@rittal-india.com www.rittal-india.com	
	JUNCTION BOXES (NON FLAME PROOF)	13	HP08	HPL ELECTRIC AND POWER LTD.	Works Address: Village Shavella, PO: Jabli, Teh-Kasauli, Dist-Solan, Himachal Pradesh-173209	Mr. Ashwani Kumar mailto:'ashwani@hplindia.com' M:9971127370	
ES37	JUNCTION BOXES (FLAME PROOF)	1	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@sudhirschwitchgears.com ; works@sudhirschwitchgears.com ;scud@vsnl.com	
ES39	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 (0250) 6458250	
	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	01244606001, Sharad (+919871150447)	
	LIGHTING FIXTURES (NON LED)	7	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	020-66098700	
	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	mohitsharma@hplindia.com'	
	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	011-25810093 ; 9810071832 (Akhilesh Agrawal ) aagrawal@sroshni.com	
	LIGHTING FIXTURES (NON LED)	10	SR01	SURYA ROSHNI LIMITED	PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING FIXTURES (NON LED)	11	HI02	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA-201301	Mr. Mohit Gautam 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; 'rahul.singh@halonix.co.in'	
	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		

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@neeverenergy.in, Jitendra Sahu <jsahu@neeverenergy.com>	
	LIGHTING FIXTURES (LED)	2	HIO1	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(phisodiya@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'	
	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:	
	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, Shahpurwada road, AGHAI Thane, Maharashtra-421601	"deepak" <deepak@mikaengineers.com> MOB: 8976737543	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LIGHTING FIXTURES ( LED)	17	KI13	M/s Kalingia Illuminatn 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@kalingialigh	
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	
ES42	LIGHTING LAMP (NON LED)	1	WP01	WIPRO LTD.	WIPRO CONSUMER CARE AND LIGHTING, 5TH FLOOR, GODREJ ETERNIA -C, OLD PUNE	020-66098700	
	LIGHTING LAMP (NON LED)	2	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	9818338922	
	LIGHTING LAMP (NON 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 LAMP (NON LED)	4	INS1	INSTA POWER	PLOT NO. - 457 PHASE - V, UDYOG VIHAR, GURGAON - 122016	124-4124000	
	LIGHTING LAMP (NON LED)	5	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	01244606001, Sharad (+919871150447)	
	LIGHTING LAMP (NON LED)	6	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA-201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING LAMP (NON LED)	7	HP01	HPL	M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL. AREA , KUNDLI, DIST.- SONENPAT (HARYANA) - 131028	mohitsharma@hplindia.com'	
	LIGHTING LAMP (NON LED)	8	SR01	SURYA ROSHNI LIMITED	PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI	011-25810093 ; 9810071832 (Akhilesh Agrawal ) aagrawal@sroshni.com	
	LIGHTING LAMP (NON 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'; 'rahul.singh@halonix.co.in'	
ES43	LIGHTING LAMP (LED)	1	NE01	Neev Luminaries	D-115 , OKHLA INDUSTRIAL AREA, PHASE-1 NEW DELHI – 110020	Phone: +91 11 4060 4830 Fax: +91 11 4060 4831 info@neevenergy.in	
	LIGHTING LAMP (LED)	2	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA-201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING LAMP (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 LAMP (LED)	4	SR01	SURYA ROSHNI LIMITED	PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI	011-25810093 ; 9810071832 (Akhilesh Agrawal ) aagrawal@sroshni.com	
	LIGHTING LAMP (LED)	5	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	01244606001, Sharad (+919871150447)	
	LIGHTING LAMP (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.- SONENPAT (HARYANA) - 131028	mohitsharma@hplindia.com	
	LIGHTING LAMP (LED)	7	INS1	INSTA POWER	PLOT NO. - 457 PHASE - V, UDYOG VIHAR, GURGAON - 122016	124-4124000	
	LIGHTING LAMP (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 (psisodia@pyrotechlighting.com ) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309	

## SUB-VENDOR DIRECTORY

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LIGHTING LAMP (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'; 'rahul.singh@halonix.co.in'	
ES45	LIGHTING SWITCH , SOCKET & S/F UNIT	1	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI- 396424	02637-265140, Mr. Jssk kumar	
	LIGHTING SWITCH , SOCKET & S/F UNIT	2	E1012	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
	LIGHTING SWITCH , SOCKET & S/F UNIT	3	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	LIGHTING SWITCH , SOCKET & S/F UNIT	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	LIGHTING SWITCH , SOCKET & S/F UNIT	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	LIGHTING SWITCH , SOCKET & S/F UNIT	6	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
ES51	MCB	1	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE	011 - 25793021	
	MCB	2	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
	MCB	3	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	MCB	4	E1120	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004	044 - 24988056, 044 - 24988057, 044 - 24988058	
ES55	MODULAR SWITCH BOARD	1	E1012	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
	MODULAR SWITCH BOARD	2	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI- 396424	02637-265140, Mr. Jssk kumar	
	MODULAR SWITCH BOARD	3	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
ES59	RECEPTACLES - DECORATIVE	1	E1012	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
	RECEPTACLES - DECORATIVE	2	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI- 396424	02637-265140, Mr. Jssk kumar	
	RECEPTACLES - DECORATIVE	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;	
	RECEPTACLES - DECORATIVE	4	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI - 400705.	Tel : 022 27620299 / 97 / 96 'mail@ajmera.net	
ES61	SWITCH BOX	1	E1012	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093	022-30418888.	
	SWITCH BOX	2	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI- 396424	02637-265140, Mr. Jssk kumar	
	SWITCH BOX	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;	
	SWITCH BOX	4	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI - 400705.	Tel : 022 27620299 / 97 / 96 'mail@ajmera.net	
	SWITCH BOX	5	S802	S.B. ELECTRICAL ENGINEERING CORPORATION	03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002	022- 22069831; 022-66637259	
	TERMINAL BLOCKS	1	C01	WAGO-CONTROLS	C 27, GREATER NOIDA, SECTOR 58, C BLOCK, SECTOR 58, NOIDA, UTTAR PRADESH 201307	0120-2580409/10	
	TERMINAL BLOCKS	2	E1038	CONNECT WELL	309A/4, 3RD FLOOR, KALKAJI, OKHLA IND AREA PH-2, GOVINDPURI, NEW DELHI, DL 110019	9811881085 09871419996 011-65908877	

## SUB-VENDOR DIRECTORY

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES62	TERMINAL BLOCKS	3	E1047	ELMEX CONTROLS PVT. LTD.	12,G.I.D.C.ESTATE,MUKARPURA ROAD,VADODARA-390010	9374631074	
	TERMINAL BLOCKS	4	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	TERMINAL BLOCKS	5	E1142	TECHNOPLAST	OPP.I.M.INTER COLLEGE, BEGUM SARAI KHURD ROAD, AMROHA - 244221, U.P.	PH:- 05922 264006 CELL NO:- 9012676000, 9319520799, 9319582467	
	TERMINAL BLOCKS	6	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	TEL.- +912066745000 Awasthi(09971119006) Tel: +91 20 6674 5103, Mobile: +91 90499 95985, Fax: +91 20 6674 5126 contact person : Vishwa bandhu E-mail:d.gupta@pmipl-online.com ;admin@pmipl-online.com	
	TERMINAL BLOCKS	7	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES67	RECEPTACLE (FLAME PROOF)	1	E1206	BALIGA ELECTRICALS	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
	RECEPTACLE (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@sudhirsutchgears.com ; works@sudhirsutchgears.com ; scud@vsnl.com	
	RECEPTACLE (FLAME PROOF)	3	FFP01	FCG FLAME PROOF CONTROL GEAR	A1/53, SHAH & NAHAR INDUSTRIAL ESTATE, SITARAM JADHAV ROAD, LOWER PAREL (W), MUMBAI-400 013	Mr. N. G. Patel CMD Office No: +91-22-43443200 Fax No: +91-22-24960313	
ES68	RECEPTACLE (NON FLAME PROOF)	1	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI - 400705.	Tel : 022 27620299 / 97 / 96 'mail@ajmera.net	
	RECEPTACLE (NON FLAME PROOF)	2	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	
	RECEPTACLE (NON FLAME PROOF)	3	E1207	CYCLE ELECTRIC DEVICE & SERV.CO.	: A-3, NEAR ANTHEM BIOSCIENCE, KSSIDC INDUSTRIAL AREA, BOMMASANDRA, BOMMASANDRA INDUSTRIAL AREA, BANGALORE, KARNATAKA 560099	Mr. H.Jaishanker +919845039081, 080 - 27833102, 080 - 27833103 : +91 80 41460985 'cycleelectric@gmail.com	
	RECEPTACLE (NON FLAME PROOF)	4	B04	BCH	20/4, MATHURA ROAD, FARIDABAD - 121006, HARYANA, INDIA	0(129)-4063000, 9015800189(Ramesh Giri) 'ramesh.giri@bchindia.com	
	RECEPTACLE (NON FLAME PROOF)	5	B02	BEST & CROMPTON	BEST & CROMPTON ENGINEERING LTD 28C, AMBATTUR INDUSTRIAL ESTATE (NORTH) AMBATTUR, CHENNAI - 600 098	Ph : +91 44 4551 4724 , MRKT DGM Mr. Vi Raj:- 9840593411 'bestcromptonviraj@gmail.com	
ES69	EMERGENCY LIGHTING UNIT ( FIXED & PORTABLE TYPE)- NON FLAME PROOF	1	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	
	EMERGENCY LIGHTING UNIT ( FIXED & PORTABLE TYPE)- NON FLAME PROOF	2	PEP05	PROLITE AUTOGLO LIMITED,	PROLITE AUTOGLO LTD 25 SINGH INDUSTRIAL ESTATE NO. 3, RAM MANDIR ROAD., GOREGAON (W), MUMBAI, MAHARASHTRA 400104, INDIA	022-67868100 sales@prolite.com	
ES70	EMERGENCY LIGHTING UNIT ( FIXED & PORTABLE TYPE)- FLAME PROOF	1					
ES71	24V SUPPLY MODULE WITH COMPLETE ACCESSORIES	1	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	
	24V SUPPLY MODULE WITH COMPLETE ACCESSORIES	2	E1066	INDCOIL	ADDRESS: 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	
	24V SUPPLY MODULE WITH COMPLETE ACCESSORIES	3	AIE01	Ames Impex Electricals Pvt. Ltd	C-1B/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330	Phone:079 2282 1648	
	RCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	

## SUB-VENDOR DIRECTORY

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES79	RCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	RCCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	RCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	RCCB	5	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	RCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
ES81	PEDESTAL FAN & CEILING FAN				REPUTED MAKE		
ES82	EXIT SIGN (FLAME PROOF)				REPUTED MAKE		
ES83	EXIT SIGN (NON FLAME PROOF)				REPUTED MAKE		
ES84	LADDER				REPUTED MAKE		
ES87	DICHORIC SPOT LIGHTING FIXTURE				REPUTED MAKE		
ES88	HAND LAMP UNIT				REPUTED MAKE		
ES89	LIGHTING DESIGNER	1	AT13	AVAIDS TECHNOVATORS PVT. LTD.	4A/58, SHANKAR ROAD, NEW DELHI-110060	Mr. Rajendra Panda M: 9910481854 (email: rajendra@avaids.com)	
	LIGHTING DESIGNER	2	BE13	BAJAJ ELECTRICALS LTD.	801 (8th floor), Rustomjee Aspire, Bhanu Shankar Yagnik Marg, Off Eastern Express Highway Sion (E), Mumbai 400022	Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. (email: srbans@bajajelectricals.com)	
	LIGHTING DESIGNER	3	KS13	KELSATEK SOLUTIONS PVT. LTD.	50/1 4TH FLOOR, CHURCH STREET, BANGALORE-560001	Mr. S S Mudaliar Sr. VP M: 6380471362 (email: mudaliar@kelsatek.com)	
	LIGHTING DESIGNER	4	SE13	M/s SUMANAM ENGINEERING SERVICES CONSULTANT	1, ADITHYA, KOWDIAR, TRIVANDRUM 695003	Mr. Anshad S Phone: 471-2437588, (email: shaw@sumanam.org)	
	LIGHTING DESIGNER	5	SM13	SPAN MANUFACTURING COMPANY LTD	27 First Floor, Bhiku Building, Murari Ghag Marg, Prabhadevi, Mumbai-400025	Ms Surbhi Jindal M: 9811026321 (email: spanmanufacturing@gmail.com, info@dalighthub.com)	System designer only for FGD, R&M and Hydro
	LIGHTING DESIGNER	6	CL13	CITELUM INDIA PVT. LTD	Y-14A, GREEN PARK MAIN, NEW DELHI-110016	Mr. Satyabrala Meher M: 8155001095. (email: smeher@citelum.in)	System designer only for FGD, R&M and Hydro
	LIGHTING DESIGNER	7	SR13	M/s SURYA ROSHNI LTD	Padma Tower 1, Rajendra Place, New Delhi-110008	Mr. Saurabh Gupta 9999433167. (email: saurabh.gupta@surya.in), AKHILESH AGRAWAL (aagrawal@surya.in)	
	LIGHTING DESIGNER	8	HP13	M/s HPL ELECTRIC & POWER PVT. LTD.	WINDSOR BUSINESS PARK, B-1D, SECTOR-10 NOIDA-201301 (UP)	Name : Mr. Mahesh Sharma Designation: Sr. GM (HOD Projects) Email : msharma@hplindia.com Contact : 9818282236 Ashwani Kumar Mob-9971127370 Email: ashwani@hplindia.com	
	LIGHTING DESIGNER	9	ME13	M/s MIKA ENGINEERS.	Survey No.-47,Shed No.-2,Aghai,Shahapur-Wada Road, Village-Aghai, THANE , Pin 421601; MAHARASHTRA	Name : Mr. Deepak Kumar Nayak Email : deepak@mikaengineers.com Contact : 8976737543 Mr. Asgar B Karimi Mob-9820019739 Email: asgar@mikaengineers.com	
	LIGHTING DESIGNER	10	FED13	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	

Makes of sub-vendor and equipment/components (excluding luminaires) mentioned in this list are indicative and shall be subject to NTPC/BHEL approval. The bidder may propose name of additional sub-vendors makes based on their experience, which will be subject to NTPC/BHEL approval.



TECHNICAL SPECIFICATION  
LIGHTING FIXTURES, LAMPS & MISC. ITEMS  
3X660 MW NTPC BARH STPP STAGE I FGD

PE-TS-442-558-E001  
Issue No: 01  
Rev. No. 00  
Date : 17.05.2024

### DOCUMENTATION REQUIREMENT

#### DRAWINGS & DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID

Sl. No.	DOCUMENT TITLE
1	PQR CREDENTIALS
2	COMPLIANCE SHEET

#### DRAWINGS & DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT ALONG WITH SUBMISSION SCHEDULE

Sl. No.	DOCUMENT TITLE	SUBMISSION SCHEDULE				CATEGORY	BHEL DRG. NO.	NTPC DRG. NO.
		Vendor submission (Days)*	BHEL Comment (Days)	Vendor submission (Days)#	BHEL & Customer comment/ approval (Days)			
1	LIGHTING FIXTURES & ACCESSORIES - DATA SHEET & GA DRAWINGS .	21	8	8	18	PRIMARY	PE-V0-442-558-E101	9558-109-PEM-PVE-B-007
2	LIGHT FIXTURE TYPE TEST REPORTS	21	8	8	18	PRIMARY	PE-V0-442-558-E951	9558-109-PEM-PVE-W-006
3	QUALITY PLAN of Lighting Fixtures DULY SIGNED & STAMPED	21	8	8	18	PRIMARY	PE-V0-442-558-E102	
4	QUALITY PLAN of Misc. items DULY SIGNED & STAMPED	21	8	8	18	PRIMARY	PE-V0-442-558-E103	
5	Mounting arrangement of Lighting Fixtures					SECONDARY	PE-V0-442-558-E104	
6	Mounting arrangement of Misc. items					SECONDARY	PE-V0-442-558-E105	
7	Type test report of Misc. items					SECONDARY	PE-V0-442-558-E106	
8	LDC & LLO OF FGD CONTROL ROOM					SECONDARY	PE-V0-442-558-E201	9558-109-PEM-PVE-G-041
9	LDC & LLO OF ROAD IN FGD AREA					SECONDARY	PE-V0-442-558-E202	9558-109-PEM-PVE-G-042
10	LDC & LLO FOR COMPRESSOR HOUSE					SECONDARY	PE-V0-442-558-E203	-
11	LDC & LLO FOR FGD ABSORBER					SECONDARY	PE-V0-442-558-E204	-
12	LDC & LLO FOR GHP GYSPUM DEWATERING BUILDING					SECONDARY	PE-V0-442-558-E205	-
13	LDC & LLO FOR LHP - BALL MILL BLDG					SECONDARY	PE-V0-442-558-E206	-
14	CONDUIT LAYOUT DRAWING FOR FGD CONTROL ROOM					SECONDARY	PE-V0-442-558-E301	-
15	CONDUIT LAYOUT DRAWING FOR ROADS					SECONDARY	PE-V0-442-558-E302	-
16	CONDUIT LAYOUT DRAWING FOR COMPRESSOR HOUSE					SECONDARY	PE-V0-442-558-E303	-
17	CONDUIT LAYOUT DRAWING FOR FGD ABSORBER					SECONDARY	PE-V0-442-558-E304	-
18	CONDUIT LAYOUT DRAWING FOR GHP GYSPUM DEWATERING BUILDING					SECONDARY	PE-V0-442-558-E305	-
19	CONDUIT LAYOUT DRAWING FOR LHP - BALL MILL BLDG					SECONDARY	PE-V0-442-558-E306	-

#### NOTES:

a) \* 1st submission within indicated days from date of purchase order.

b) # Submission (within indicated days) after incorporating all BHEL comments.

c) Primary documents shall be considered for Delay analysis.

d) Submission schedule of Secondary documents shall be same as Primary documents (after receiving input drawing from BHEL).

e) The list of LDC/LLO/CLO drawings mentioned above is tentative and can change during detailed engineering. (LDC- Lighting Design Calculation, LLO- Lighting Layout Drawing, CLO- Conduit Layout Drawing)

#### DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT

Sl. No.	DOCUMENT TITLE
1	APPROVED DOCUMENTS
2	Field Quality Plan of lighting fixtures



TECHNICAL SPECIFICATION  
LIGHTING FIXTURES, LAMPS & MISC. ITEMS  
3X660 MW NTPC BARH STPP STAGE I FGD

PE-TS-442-558-E001

Issue No: 01

Rev. No. 00

Date : 17.05.2024

### COMPLIANCE CERTIFICATE

1	It is hereby confirm that the technical specification (sheet 1 to 62 ) has been read, understood. We confirm compliance to the tender specification including any clarification and amendments without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked for in NIT shall stand withdrawn.

Signature of authorised Representative :

Name and Designation :

Name & Address of the Bidder :

Date

**3X660 MW NTPC BARH STPP STAGE I FGD  
LIGHTING FIXTURES,LAMPS & MISC. ITEMS**

**BOQ CUM UNPRICED SCHEDULE  
ANNEXURE-I**

Sr. No.	Item code	Item description	Unit	Order Quantity	UNIT PRICE	TOTAL PRICE	REMARKS
<b>A</b>	<b>Lighting Luminaires (complete with accessories)</b>						
1	558-12118-A	Luminaire Type FC06 (LED)	Nos.	435			
2	558-12120-A	Luminaire Type FC81 (LED)	Nos.	15			
3	558-12195-A	Luminaire Type FC07 (LED)-DC	Nos.	16			
4	558-12196-A	Luminaire Type FC33 (LED)-DC	Nos.	6			
5	558-12197-A	Luminaire Type FC34 (LED)-DC	Nos.	10			
6	558-12201-A	Luminaire Type SF63 (LED)	Nos.	18			
7	558-12199-A	Luminaire Type SB02 (LED)	Nos.	85			
8	558-12200-A	Luminaire Type SB03 (LED)	Nos.	40			
9	558-12122-A	Luminaire Type SS62 (LED)	Nos.	95			
10	558-12205-A	Luminaire Type SW41 (LED)	Nos.	275			
11	558-12206-A	Luminaire Type SW42 (LED)	Nos.	55			
12	558-12140-A	Luminaire Type FC30 (LED)	Nos.	76			
<b>B</b>	<b>Switch boxes for individual control of circuits</b>						
1	558-12014-A	Type SWB1 Decorative	Nos.	20			
2	558-12015-A	Type SWB2 Decorative	Nos.	15			
3	558-12016-A	Type SWB3 Decorative	Nos.	10			
4	558-12099-A	Type SWB4 Decorative	Nos.	4			
<b>C</b>	<b>Junction boxes</b>						
1	558-12026-A	Type JB-F	Nos.	1076			
2	558-12027-A	Type JB-FE	Nos.	15			
<b>D</b>	<b>Receptacles</b>						
1	558-12079-A	Type RA	Nos.	22			
2	558-12081-A	Type RB	Nos.	42			
3	558-12082-A	Type RC	Nos.	12			
<b>E</b>	<b>Fans</b>						
1	558-12010-A	Ceiling fan 1200 mm sweep	Nos.	10			
2	558-12094-A	Pedestal fan	Nos.	10			
<b>F</b>	<b>Emergency lighting Units</b>						

1	558-12018-A	With Ni-Cd battery and 2 X 10W LED	Nos.	12			
G	558-12253-A	FLEXIBLE CONDUIT, TERNE COATED	Mtr.	1500			
H	<b>Ladder</b>						
1	558-12022-A	Free standing adjustable from 5M to 10M aluminium ladder	Nos.	1			
2	558-12091-A	10m high car wheel mounted adjustable aluminium ladder adjustable upto 10m high	Nos.	1			
I	558-12019-A	EXIT SIGN	Nos.	10			
J	558-12139-A	OCCUPANCY SENSOR	Nos.	5			
K	<b>Drivers-Lighting Luminaires</b>						
1	558-12231-A	Driver-Luminaire Type FC06 (LED)	Nos.	5			
2	558-12235-A	Driver-Luminaire Type FC07 (LED)-DC	Nos.	2			
3	558-12236-A	Driver-Luminaire Type FC33 (LED)-DC	Nos.	2			
4	558-12237-A	Driver-Luminaire Type FC34 (LED)-DC	Nos.	2			
5	558-12250-A	Driver-Luminaire Type FC30 (LED)	Nos.	5			
6	558-12233-A	Driver-Luminaire Type FC81 (LED)	Nos.	2			
7	558-12242-A	Driver-Luminaire Type SB02 (LED)	Nos.	5			
8	558-12243-A	Driver-Luminaire Type SB03 (LED)	Nos.	5			
9	558-12238-A	Driver-Luminaire Type SF63 (LED)	Nos.	2			
10	558-12244-A	Driver-Luminaire Type SS62 (LED)	Nos.	5			
11	558-12246-A	Driver-Luminaire Type SW41 (LED)	Nos.	5			
12	558-12247-A	Driver-Luminaire Type SW42 (LED)	Nos.	5			
L	<b>Structural steel</b>						
1	558-12085-A	Structural steel	MT	3			
M	<b>Hume Pipe</b>						
1	558-12025-A	Hume pipe 100 mm dia	mtrs.	50			
N	<b>GI wire &amp; Flat</b>						
1	558-12023-A	14 SWG Wire	mtrs.	14000			
2	558-12097-A	25X6 mm GS Flat	mtrs.	300			
3	558-12008-A	50X6 mm GS Flat	mtrs.	100			
4	558-12007-A	40 mm Dia MS Rod	meter	270			
		(Each Rod 3m long)					

NOTES	
1	CONTAINERS AS PER SPECIFICATION ARE TO BE SUPPLIED ALONG WITH FIRST SUPPLIES. THE PRICE OF CONTAINER IS DEEMED TO BE INCLUDED IN PACKAGE PRICE. NO SEPARATE CHARGES SHALL BE PAYABLE.
2	THE MATERIAL SHALL BE SUPPLIED IN LOTS. LOTS SHALL BE RELEASED PROGRESSIVELY BASED ON APPROVED CONDUIT LAYOUT DRAWINGS OF DIFFERENT AREAS AND PROJECT REQUIREMENT.
3	LIGHTING SYSTEM DESIGN CHARGES ARE DEEMED TO BE INCLUDED IN THE PRICE OF ABOVE ITEMS. NO SEPARATE CHARGES FOR DESIGN ACTIVITY WILL BE PAYABLE.
4	For item at SI. No A above "Lighting Luminaires", the above quantity variation shall be calculated at the total order value against item at SI. No A (i.e. sum of order value of sub items 1 to 12)."
5	TYPE TESTS CHARGES ARE DEEMED TO BE INCLUDED IN THE PRICE OF ABOVE ITEMS. NO SEPARATE CHARGES FOR TYPE TESTING WILL BE PAYABLE.

3X660 MW NTPC BARH STPP STAGE I FGD						
LIGHTING FIXTURES,LAMPS & MISC. ITEMS						
BOQ cum Price Schedule (MANDATORY SPARES) ANNEXURE-II						
Sr. No.	Item description	Unit	Order Quantity	UNIT PRICE (EX-	TOTAL PRICE (EX-	REMARKS
A	Lighting Luminaires (complete with accessories)					
1	Luminaire Type FC06 (LED)	Nos.	5			
2	Luminaire Type FC81 (LED)	Nos.	5			
3	Luminaire Type FC07 (LED)-	Nos.	5			
4	Luminaire Type FC33 (LED)-	Nos.	5			
5	Luminaire Type FC34 (LED)-	Nos.	5			
6	Luminaire Type SF63 (LED)	Nos.	5			
7	Luminaire Type SB02 (LED)	Nos.	5			
8	Luminaire Type SB03 (LED)	Nos.	5			
9	Luminaire Type SS62 (LED)	Nos.	5			
10	Luminaire Type SW41 (LED)	Nos.	5			
11	Luminaire Type SW42 (LED)	Nos.	5			
12	Luminaire Type FC30 (LED)	Nos.	5			

NOTE : The requirement for mandatory spare as per above BOQ cum unprice schedule shall be fully complied with.

**3X660 MW NTPC BARH STPP STAGE I FGD  
LIGHTING FIXTURES,LAMPS & MISC. ITEMS**

**BOQ cum Price Schedule  
(SUPERVISION OF ERECTION & COMMISSIONING)**

**ANNEXURE-III**

SR. No.	ITEM CODE	ITEM DESCRIPTION	UOM	Quantity	UNIT RATE(INR)
1.0	558-12086-A	<b>SUPERVISION OF ERECTION &amp; COMMISSIONING</b>			
1.01		CHARGES PER VISIT	VISIT	4	20000
1.02		MANDAYS CHARGES	DAYS	20	5000

Notes :

1. For supervision of E&C 4(four) Visits and 20 (twenty) Mandays to be considered. The prices shall be inclusive of charges of Airfare (To & Fro), Boarding, Lodging, Medical, Insurance etc.

2. Amount payable per visit = Visit charges as per Sl. No 1.01 above (+) Unit Price for mandays charges as per Sl. No 1.02 above (x) No. of mandays at site (to be certified by BHEL Site)

3. The total Mandays mentioned for supervision of E&C also include Mandays of inspection of installation for completeness and correctness of work.

4. Unit rate for 1.01 and 1.02 above shall remain firm. Supervision of E&C rate shall not be considered for price evaluation.

5. Nos. of visit and Mandays for supervision of E&C may increase based on project requirement.

	TECHNICAL SPECIFICATION LIGHTING FIXTURES, LAMPS & MISC. ITEMS 3X660 MW NTPC BARH STPP STAGE I FGD	PE-TS-442-558-E001
		Issue No: 01
		Rev. No. 00
		Date : 17.05.2024

**PRE QUALIFICATION REQUIREMENT (TECHNICAL)**



**PRE-QUALIFICATION REQUIREMENTS FOR LIGHTING  
FIXTURES, LAMPS & MISC. ITEMS**

REVISION NO. 00 DATE 01/05/2024

SHEET NO. 1 of 2

**ITEMS** : Lighting Fixtures, Lamps, Receptacles, Junction boxes and Miscellaneous Items.

**SCOPE:**

Supply (Including Design) : YES

Erection &amp; Commissioning : No

Services : YES (Supervision of E&amp;C)

- 1.0 Manufacturing Capability**  
LED Lighting fixture manufacturer as per sub-vendor list (refer technical specification)  
or  
i) Vendor should be a Manufacturer of LED lighting fixture.  
ii) Availability of type test reports conducted at independent Lab or witnessed by third party of LED fixture as per relevant standard.  
iii) Availability of routine & acceptance test reports of LED lighting fixture to establish in-house capability at manufacturer's works to carry out routine & acceptance tests as per relevant standard.  
iv) Vendor should have supplied LED lighting fixtures to power plant/ industrial installations.
- 2.0 Lighting System Design Capability**  
Lighting designer as per sub-vendor list (refer technical specification).  
or  
The vendor / agency should have engineered / prepared Minimum 33 number drawings including Lighting Design calculations (Minimum 10 No.), Lighting layout Drawings (Min. 10 No.), Conduit layout drawings (Minimum 10 No.), Power distribution schemes (Minimum 2 no.) and lighting single line diagrams (Minimum 1 No.) for power stations or refineries and Petro-Chemical plants/process plants/ other industrial installations. Drawings should be customer approved.

**Notes:**

- In case vendor is able to meet criteria at Sl. No. 1 only and not Sl. No. 2 above, vendor can tie-up with any lighting designer (herein termed associate) who is meeting all criteria mentioned in S. No. 2 & submit the credentials of associate if required. Vendor to submit MOU on non-judicial stamp paper of Rs. 100 /- with associate at bidding stage.
- In case vendor is able to meet criteria at Sl. No. 2 only and not Sl. No. 1 above, vendor can tie-up with any lighting manufacturer (herein termed associate) who is meeting all criteria mentioned in S. No. 1 & submit the credentials of associate. Vendor to submit MOU on non-judicial stamp paper of Rs. 100 /- with associate at bidding stage.
- Bidder to note that MOU on non-judicial stamp paper once offered to BHEL cannot be changed till the execution of the project.

PREPARED BY

*Gunjal Verma*  
01/05/24

NAME: GUNJAL VERMA  
DESIGNATION: MANAGER

CHECKED BY

*Ashim K Das*  
01/05/24  
NAME: ASHIM K DAS  
DESIGNATION: Sr MANAGER

*for Narendranath Jajwara*  
01/05/24  
NAME: NARENDRA NATH JAJWARE  
DESIGNATION: Sr MANAGER

REVIEWED BY

*Praveen Dutta*  
01/05/24

NAME: PRAVEEN DUTTA  
DESIGNATION: AGM

APPROVED BY

*Debasisa Rath*  
01/05/24  
NAME: DEBASISA RATH  
DESIGNATION: GM-ELECT



3X660 MW NTPC BARH STPP STAGE I FGD

PE-PQ-442-558-E006

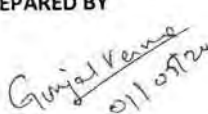
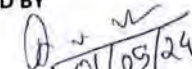
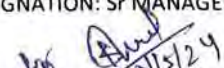
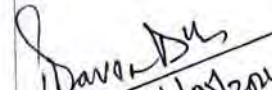

PRE-QUALIFICATION REQUIREMENTS FOR LIGHTING  
FIXTURES, LAMPS & MISC. ITEMS

REVISION NO. 00 DATE 01/05/2024

SHEET NO. 2 of 2

## General Points of PQR:

1. Cut-off date for credentials shall be considered same as date of techno-commercial bid opening.
2. **Consideration of offer shall be subject to customer's approval of bidders.**
3. 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.
4. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
5. After satisfactory fulfilment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all other terms of the tender.

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
 NAME: GUNJAL VERMA DESIGNATION: MANAGER	 NAME: ASHIM K DAS DESIGNATION: Sr MANAGER  NAME: NARENDRA NATH JAJWARE DESIGNATION: Sr MANAGER	 NAME: PRAVEEN DUTTA DESIGNATION: AGM	 NAME: DEBASISA RATH DESIGNATION: GM-ELECT

**3x660 MW NTPC BARH STPP STAGE I (FGD System Package) (Job No. 442)**

These Conditions shall be read and construed along with General Conditions of Contract (GCC) Rev. 06 & GST related Corrigendum to GCC Rev. 06, to be enclosed along with the tender enquiry. In case of any conflict or inconsistency, the conditions given in SCC shall prevail over the GCC and its corrigendum.

Sl. No.	Title	Description
1.	Project Name	3x660 MW NTPC BARH STPP STAGE I (FGD System Package)
2.	Nature of Project & Type of Bidding	Mega and Competitive Bidding
3.	Customer Order Ref. No.	CS 9558-109(1A)-2-FC-NOA-6724 dtd. 18.09.2018 CS 9558-109(1A)-2-SC-NOA-6725 dtd. 18.09.2018
4.	BHEL's Customer	NATIONAL THERMAL POWER CORPORATION (NTPC)
5.	<b>NTPC Site GST No.</b>	<b>10AAACN0255D2ZC</b>
6.	Customer Consultants	No consultant
7.	Consignee Address (Bill To)	<b>For Supply Packages:</b> BHEL, Power Sector-Project Engineering Management, Power Project Engineering Institute, Plot No. 25, Sector-16A, Noida, Uttar Pradesh-201301. <b>GSTIN No.- 09AAACB4146P2ZC</b>  <b>For Turnkey Packages (where BHEL-PEM will issue only the LOA and Purchase Order shall be issued by BHEL-PSER):</b>  Construction Manager, Bharat Heavy Electricals Limited, NTPC BARH STPP, PO: BARH, DIST: PATNA, BIHAR PIN:803213 <b>BHEL PSER GSTIN No.- 10AAACB4146P1ZU</b>
8.	Delivery Address (Ship To)	Construction Manager, Bharat Heavy Electricals Limited, NTPC BARH STPP, PO: BARH, DIST: PATNA, BIHAR PIN:803213
9.	BHEL Site Office Address	Construction Manager, Bharat Heavy Electricals Limited, BARH STPP, PO: BARH, DIST: PATNA, BIHAR PIN:803213
10.	Location of Plant	The proposed power station is located at the latitude and longitude of 25 deg 29' 10" N and 85 deg 45' 40" E respectively. The plan site is situated between NH-31 and Patna-Mokama main railway line. Barh, the nearest town is about 4.0 kms away from the project site. The nearest rail head Barh railway station of Patna-Mokama section on main trunk route is approximately 3.0 km away from the project site. The nearest airport at Patna is located at a distance of approximately 75.0 kms from the project site.
11.	Mode of Dispatch	Air, Road, Rail & Sea Transportation  For Indigenous Supplies: By Rail/Road on door delivery and freight pre-paid basis. For Imported Supplies: On C&F basis. Transit Insurance will be in BHEL scope
12.	Road Permit /E-waybill	Road Permit / E-way bill, to be arranged by Supplier/ transporter/ BHEL (as per GOI mandate).
13.	BHEL GSTIN Details	<b>For Supply Packages:</b> BHEL-PEM is registered in the State of Uttar Pradesh with GSTIN No.- 09AAACB4146P2ZC <b>For Turnkey Packages:</b> BHEL PSER GSTIN No.- 10AAACB4146P1ZU

14.	Transit Insurance	<p><b>In BHEL Scope.</b></p> <p>For each dispatch, vendor shall inform the following to the Underwriter under intimation to BHEL-PEM and BHEL Site office:</p> <ul style="list-style-type: none"> <li>(i) Policy No.</li> <li>(ii) Consignee Name.</li> <li>(iii) Consignment Details (items with their weights and value in INR).</li> <li>(iv) Project Name and P.O. No.</li> <li>(v) LR No. and Date, Dispatch Origin, Destination Details and Invoice No.</li> </ul> <p>Vendors to intimate the underwriters quoting the insurance Policy No. as mentioned in the Purchase Order.</p>
15.	Dispatch Intimation	<p>Yes, in writing, not less than 30 (Thirty) days prior to date of shipment and dispatch details to be sent to:</p> <ul style="list-style-type: none"> <li>a) BHEL Site office (As mentioned in Sl. No. 9 above)</li> <li>b) BHEL PEM Noida (As mentioned in NIT)</li> <li>c) BHEL PSER, Kolkata (For Turnkey Packages)</li> </ul> <p>At the point of dispatch, vendor must furnish docs required as given below through Email / Fax:</p> <ul style="list-style-type: none"> <li>i. Vendor's invoice</li> <li>ii. LR / RR / GR / Courier Receipt</li> <li>iii. Packing List/ Challan indicating the items dispatched (with their weights)</li> <li>iv. Insurance intimation letter informing the underwriters about the dispatches</li> <li>v. MDCC (of BHEL / NTPC), as applicable</li> </ul> <p>It is Vendor's responsibility to ensure availability of trucks well in advance where consignment will require more number of trucks to be deployed for dispatches. <b>No concession for non-availability of trucks shall be admissible after having given dispatch clearance.</b></p>
16.	Document required for Vendor's Payment.	<p><b>For materials originating from Indian territory</b></p> <p>For claiming the payment against Dispatch, MRC and Freight, documents as mentioned in GCC Rev. 06 &amp; its corrigendum shall be submitted by the vendor to BHEL.</p> <p><b>Packing List</b> must comply to Clause No. 19.3 of General Commercial Terms &amp; Conditions of GCC Rev. 06. Description of items in Packing List shall be as per PO, <b>so that proper correlation between PO &amp; Packing List may be made.</b></p> <p>Soft copy of documents for claiming payment shall be submitted by vendor as advance copy.</p> <p><b>For materials originating from non-Indian Territory</b></p> <p>Three (3) original and Three (3) copies of clean bill of lading or One (1) clean original Airway Bill &amp; Three (3) copies, in case of air freight.</p> <p>One (1) original and Three (3) copies of signed Invoices. One (1) original and Three (3) copies of Packing List (clearly showing number of packages, gross weight and net weight).</p> <p>Three (3) copies of certificate of country of origin.</p> <p>Copy of MDCC from BHEL / NTPC (as applicable)</p> <p>One (1) Original + One (1) copy of Inspection Certificates/ Inspection Reports &amp; Approved Test Certificates (if any), issued by BHEL or its authorized representative / The Customer or its authorized representative.</p> <p>Three (3) of certificate from the vendor to the effect that drawings and catalogues for customs clearance purpose have been kept with the packages for shipment.</p> <p>Three (3) copies of certificate from the vendor to the effect that the contents in each case are not less than that entered in the invoices and guaranteed as new and as per the relevant technical specifications.</p> <p>Guarantee Certificate - One (1) Original + One (1) copy.</p> <p>PVC Calculation and copy of all applicable indices, if PVC applicable - Two (2) copies.</p>

MJ  
*[Signature]*  
 28/03/19


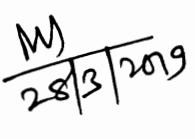

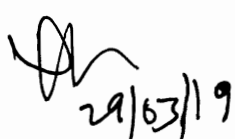
17.	Buyer and Paying Authority	For packages where PEM will issue the Purchase Order: <b>BHEL PEM</b> will be the paying authority.  For packages where BHEL-PEM will issue only the LOA and Purchase Order shall be issued by BHEL-PSER: <b>BHEL BARH Site will be the paying Authority.</b>
18.	Demurrage charges	Demurrage charges shall be paid by supplier/ vendor only to the transporter. No claim shall be acceptable to BHEL in this regard.
19.	Unloading, Storage & Movement of material at site	a.) By BHEL Site office for Supply Packages. b.) By Vendors for Turnkey packages (i.e. Supply and Erection & Commissioning)  <b>Note:</b> The Supplier shall furnish LR wise Gross Wt. of the consignment for the purpose of handling the consignment by BHEL Site Contractor. Please note that unloading of materials at Site shall sometimes may take 3-4 days. As such, transporters to be advised suitably before dispatch of materials in this regards. Also, no claim on a/c of delay in unloading before this period shall be entertained. Prior intimation as mentioned in sl. no. 15 above is solicited.
20.	Custom Duty	Custom Duty exemption shall be as per Mega Project Guidelines. The bidder to indicate the import contents i.e. List of the Items, Currency of Import and Country of Import including CIF Value in their offers. BHEL shall confirm, the availability of CIF value for a particular package, if any, at the time of NIT.
21.	Taxes & Duties (For Domestic Bidders)	As per General Conditions of Contract (GCC Rev. 06) & GST related Corrigendum to GCC Rev. 06
22.	Taxes & Duties (For Order Directly to Foreign Bidders)	In case of Foreign bidders, quoted prices & Dispatches shall be on C & F Indian port basis and the Taxes & duties in the country of dispatch shall be borne by Foreign bidder. All the Taxes & duties and other charges applicable in India shall be borne by BHEL-PEM for the direct order placed by PEM to the Foreign Bidder.
23.	Inspection Agency	Inspection of packages shall be carried out by agency as per below Inspection category of packages:  i) <b>Cat-I:</b> Inspection shall be done jointly or separately by NTPC and BHEL or BHEL's TPIA . ii) <b>Cat-II:</b> Inspection shall be done by BHEL only. iii) <b>Cat-III:</b> Certificate of Compliance shall be furnished by Vendor.  <b>Note:</b> Please note, for Cat I & II items BHEL reserve the right to carry inspection by themselves or through nominated Third Party Inspection Agency (TPIA). For inspecting Agency for various items, vendor may refer to the Quality Plan. Third party inspection agency, if any, shall be informed after placement of Purchase Order.
24.	Inspection procedure for Domestic supplies	<u>For Domestic supplies:</u>  Vendor shall raise inspection call at least 15 business days in advance on BHEL CQS website to applicable inspection agency (as mentioned in PO/LOI or to be informed later) and submit copy of inspection call to BHEL-PEM for arranging NTPC inspection/Joint inspection on the proposed date, as applicable. MDCC shall be issued on the basis of clear inspection report (CQIR).  <u>For Foreign supplies:</u>  In case of Foreign supplies, if NTPC approved 3rd party inspection agency does not participate in the inspection, test certificates & inspection reports duly accepted by the agreed Inspection agency shall be submitted in soft copy to BHEL-PEM. The same shall be reviewed by PEM and then, sent to NTPC for clearance. The dispatch clearance (MDCC) by NTPC/ BHEL as applicable shall be given to the foreign supplier or representative in India after acceptance of above test certificates.
25.	Material Dispatch Clearance Certificate (MDCC) Issuing Agency	<b>For Cat-I item</b> , MDCC shall be issued by NTPC and it's the responsibility of vendor to arrange MDCC from them and furnish <b>original MDCC to BHEL</b> . Copy of NTPC MDCC shall be attached with Invoice by Vendor for claiming payment from BHEL.  <b>For Cat- II &amp; Cat-III items</b> , MDCC shall be issued by BHEL, which shall be valid for the vendor payment. However, the vendor shall furnish all requisite documents like Material Test Certificates, Inspection Reports etc. required for obtaining of NTPC MDCC by BHEL.

Q

M

*[Signature]*  
28/03/19

26.	Packing, Identification & marking [if not specified in NIT]	<p>Each box shall be marked with Capital Letters in "Red" indicating the <b>PEM SUPPLY (Main Supply/ Commissioning Spares/ Mandatory Spares)</b> for 3x660 MW NTPC BARH STPP STAGE I (FGD System Package).</p> <p><b>NOTE:</b> Main supply item and items for commissioning spares must be packed separately. Each package delivered under the Contract shall be marked by supplier and such marking must be distinct and in English language (all previous irrelevant markings being carefully obliterated). Such marking shall show the description and quantity of contents, the name and address of consignee, the Gross weight and Net weight of the package, the name of the Supplier, PEM P.O. reference number, with a distinctive number of mark sufficient for purposes of identification. Besides above necessary, packing shall bear a special marking 'TOP', 'BOTTOM', 'DO NOT TURN OVER', "KEEP DRY", "HANDLE WITH CARE", etc.</p> <p><b>IMPORTANT: -</b></p> <ul style="list-style-type: none"> <li>• <b>Two copies of respective standard manufacturer's erection instruction/operation instruction manual shall be kept in each package / container for immediate reference by BHEL site and same shall be reflected in packing slip also</b></li> <li>• <b>The Packing list details for the consignment must be put inside the Box/Boxes.</b></li> </ul> <p>Items like pumps etc. shall essentially have O&amp;M Manuals and E&amp;C guidelines duly enclosed in the packing box. Certificate to such effect shall also be reflected in packing slip.</p> <p>Mandatory spares shall be properly packed separately in separate box painted in Red, indicating <b>Mandatory Spares in the bold letters</b> and each spare shall be properly tagged giving details i.e. item number of the equipment in line with the CUSTOMER approved BBU for Mandatory spares &amp; Number per item (to match the description given in the packing slip) to facilitate their proper identification by PVUNL/ NTPC. One Copy of Packing list must be put inside the Box along with Manufacturing drawing no. reference, Catalogue reference etc.</p>
27.	Submission of Final Drgs/Docs along with O&M Manual, Type Test Certificates (if any)	As per GCC Rev. 06/ Technical Specification/Kick-off meeting.

	Prepared by	Checked by	Reviewed by	Approved by
<b>Name</b>	Ravi Yadav	Manish Kr. Sinha	P.K. Gautam	Deepak Gupta
<b>Designation</b>	Dy.Engr./ PG III	Manager./ PG III	SDGM/ PG III	AGM & DH/ PG III
<b>Signature</b>	 28/03/19	 28/3/2019	 28/03/19	 29/03/19