

VOLUME II

**2 X 660 MW UDANGUDI SUPERCRITICAL THERMAL
POWER PROJECT-STAGE-1**

TECHNICAL SPECIFICATION

FOR

**LIGHTING FIXTURES, LAMPS AND MISCELLANEOUS
ITEMS**


SPECIFICATION NO: *PE-TS-435-558-E006*

REVISION: 0



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UP (INDIA) – 201301**


732157/2022/PS-PEM-EI

	TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS		SPECIFICATION NO. PE-TS-435-558-E006	
			VOLUME II	
			SECTION - I	
	2 X 660MW UDANGUDI STPP STAGE-I	REVISION 0	DATE: 10.03.2022	
SHEET 1 OF 1				

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COMPLIANCE CERTIFICATE

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

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There is no deviation with respect to specification other than those furnished in the 'schedule of deviations'.
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in BOQ-Cum-Price schedule of the specification shall not be considered (i.e. technical description & quantities as per specification shall prevail).

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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS


LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS

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1.0 SCOPE OF SUPPLY AND SERVICES
1.1 SUPPLY:

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

It is not the intent to specify completely herein all details of the equipment, nevertheless, the equipment shall be complete and operative in all respects and shall conform to the highest standard of engineering, design and workmanship.

1.2 SYSTEM DESIGN ENGINEERING:

System Design Engineering is included in vendor's scope, which includes design of complete lighting system for indoor and outdoor areas of the power plant. Please refer the list of LLO/LDC/CLO/PDS drawings as per Annexure-B for the tentative areas to be covered by the lighting system. The aspect of engineering covers preparation of electrical distribution and control schemes, quantity estimation, luminaire layout drawings, conduit layout drawings, wiring schemes upto luminaires, cable schedules and all associated design work not specifically mentioned in the specification. The quantity estimation to include all items required for the complete lighting system viz. lighting fixtures, lamps, Lighting DBs, Welding DBs, lighting panels, conduits, PVC wires etc.

1.3 Supervision of Erection & Commissioning (as required by site) of lighting system is included in vendor's scope.

1.4 Although Erection and Commissioning is not included in vendor's scope, the vendor shall still not be absolved of his responsibility of establishing the correctness of engineering and equipment at site.

1.5 Standard technical requirements of the lighting fixtures, lamps & miscellaneous items and lighting system design requirements are indicated in Section-II. Project specific requirements/changes are listed in Section-I.

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

1.7 Review of sub-vendor's documents by the purchaser shall not relieve the vendor from the responsibility of design & supply.

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

1.9 Make of all equipment and components shall be as per attached Sub-Vendor List enclosed as per Annexure-A to section- I. However same shall be subject to end customer approval without any commercial implication.

2.0 BILL OF QUANTITIES:

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



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3.0 STATUTORY AND REGULATORY REGULATION

3.1 Statutory and regulatory regulation shall be applicable as per Indian Electricity Rule, 1956 with amendment-3 Rule no. 35, 48, 49, 50, 61 & 64 for illumination & low voltage power services.

4.0 DOCUMENTATION

4.1 Documents required along with the technical offer: -

- a) Signed & Stamped copy of Compliance certificate.
- b) Duly filled in signed & stamped copy of scope matrix for broad activities.
- c) Signed & stamped copy of unpriced price schedule with "quoted" word indicated against all items.
- d) Duly filled in signed & stamped copy of Datasheet-B.

4.2 Documents required after award of LOI/PO shall be as per NIT (to be submitted by successful bidder).

5.0 SPECIFIC TECHNICAL REQUIREMENTS

5.1

S. No.	Reference clause No. of Section-II	Specific requirement/Change
1	4.2.3(c), Page-7 of 38	The supply to the DC lighting panels shall be ALWAYS ON .
2	5.2.1(n), Page-17 of 38	The luminaire efficacy shall be not less than 90 Lm/W for LED luminaries.
3	5.2.1(n), Page-17 of 38	The LED used in the luminaires shall have colour rendering index (CRI) of Min 70 . 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.
4	5.2.1(n), Page-17 of 38	Following protection to be added under clause 15: ➤ Surge Protection
5	5.12(g) (IV), Page-23 of 38	Type RD: It shall have the following: i. 250A , 415V, 3-phase-neutral earth, metal clad socket with cover. ii. Rotary/ MCCB , heavy duty 250A switch conforming to applicable standard.


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6	5.14(b), Page-24 of 38	They shall be flush mounted in the walls in the office areas where false ceiling is provided. Also, switch control shall be provided for controlling lighting fixtures located indoor.
7	Add new clause 7.2.1 after clause 7.2, Page-27 of 38	New Clause 7.2.1: 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.
8	12.4, Page-30 of 38	Referred clause shall be read as: Preparation of as-built drawings shall be in BHEL Scope. However, vendor shall be furnishing the Final AutoCad dwgs to BHEL.
9	-	For recessed type fixtures provided in Aluminium Frame type false ceiling, suitable provision for removing the fixture and accessing the driver for maintenance from bottom shall be provided.
10	-	Please note that following items are excluded from the supply of this package: Poles, Mast, LDB, WDB, LP, Rigid conduit, Wire & Mini truck.
11	-	Pedestal Fan will have 500mm Sweep.
12	Additional Clause No. 6.0 to be added under Annexure-I of Section-II as below: -	

6.0

S. No.	Type of Luminaire	Description	Total Luminous flux (Lumen) of luminaire- Minimum value	Measured Electrical Input Power(Watt)- Maximum value
1	FC02 (LED)	Industrial type LED fixture suitable for conduit /surface/ suspended mounting, with integral driver aesthetically designed for Switchgear / Equipment room/ Staircase/ Corridor	3780	42
2	FC06 (LED)	Industrial type LED fixture suitable for conduit /surface/ suspended mounting, with integral driver aesthetically designed for Switchgear / Equipment room/ Staircase/ Corridor	3780	42
3	FC26 (LED)	Panel (approx. 1200 mm X 300 mm) LED luminaire suitable for recess mounting in false ceiling with integral driver aesthetically designed for Control Room/ Office	3780	42

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4	FC81 (LED)	Corrosion proof, totally enclosed type LED fixture having integral driver	3780	42
5	FC32 (LED)	Decorative, surface mounted LED fixture having integral driver	3780	42
6	FC07 (LED)	Industrial type LED fixture suitable for conduit/ surface/ suspended/ column mounting, having integral driver. Fixture shall operate on 220V DC input supply. Necessary accessories like DC to AC convertor etc. to be included accordingly, if required	1260	14
7	FC33 (LED)	Decorative, recessed type LED fixture having integral driver. Fixture shall operate on 220V DC input supply. Necessary accessories like DC to AC convertor etc. to be included accordingly, if required	1260	14
8	FC34 (LED)	Well glass, dust proof type LED fixture having integral driver. Fixture shall operate on 220V DC input supply. Necessary accessories like DC to AC convertor etc. to be included accordingly, if required	1260	14
9	SF63 (LED)	Flood light, heavy duty type LED fixture	16920	188
10	SF64 (LED)	Flood light, heavy duty type LED fixture	27000	300
11	SF66 (LED)	Flood light, heavy duty type LED fixture	45000	500
12	SB11 (LED)	Medium bay, Industrial type LED fixture	10080	112
13	SB02 (LED)	High Bay Industrial type LED fixture	16920	188
14	SB03 (LED)	High Bay Industrial type LED fixture suitable for turbine hall operating floor (mounting height > 10 m)	24750	275
15	SS62 (LED)	Street light LED fixture	10080	112
16	SS63 (LED)	Street light LED fixture	16920	188
17	SW41(LED)	Well glass type, vapour proof LED fixture suitable for Boiler / ESP platforms	4680	52

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18	SW42(LED)	Well glass type, vapour proof LED fixture suitable for Boiler / ESP platforms	7380	82
19	MW96(LED)	Well glass, flame proof increased safety luminaire LED fixture having an integral driver suitable for division-2, Group IIA/IIB of hazardous areas	8460	94
20	MW98(LED)	Well glass, flame proof increased safety luminaire LED fixture having an integral driver suitable for division-2, Group IIC of hazardous areas (As per IS 2148 or class-I, Division-II as per NEC 70-428)	8460	94
21	FC30 (LED)	Panel 600 mm X 600 mm LED luminaire suitable for recess mounting in false ceiling with integral driver aesthetically designed for Control Room/ Office	3780	42
22	Downlighter (LED)	Recessed Mounted Downlighter with Integral driver aesthetically designed for Control Room/ Office	1620	18


Notes:


- 1) LED must comply all the parameters of IS 16105 or IESNA LM-80-08.
- 2) The Luminaire must comply all the parameters of IS 16106 or IESNA LM-79-08.
- 3) The LED driver should comply to IEC 61347-2-13, IS 15885: Part 2: Sec 13, IEC 62384, IS 16104 and CISPR 15.
- 4) The luminaire complete with all accessories shall comply to relevant specified standards.
- 5) The values of maximum measured electrical input power are specified above for the luminaire (including any accessories like driver module etc.). Values of luminous flux and maximum input power shall be measured as per IS 16106 & shall not be subject to any further tolerance.
- 6) All parameters mentioned in Section-II, Clause 5.2.1 are to be complied in totality.


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		Date: 10.03.2022
5.0	SPECIFIC TECHNICAL REQUIREMENTS (Continued)	
5.2	LIGHTING SYSTEM DESIGN:	
5.2.1	Lighting system will be designed to ensure adequate uniform visual performance, safety & reliability and will be free from excessive glare and flicker from discharge lamp. In main control room, particular attention will be given to ensure that illumination is proper and aesthetic. Control room lighting will be such as to prevent any glare/ luminous patch on control board /panel/ VDUs when viewed from an angle.	
5.2.2	All fixtures shall be of a proven design for applications in power plant environment. All outdoor fixtures shall be weatherproof type. All outdoor fixtures shall be with DOP IP-55.	
	Type of fixtures/ lux level shall be as per Annexure-I	
5.2.3	LED medium bay fixtures will be installed in areas with sufficient minimum headroom of more than 5 meter. However, above minimum headroom may or may not be feasible in boiler/ HRSG area and fixture will be mounted on columns/bottom of platform as per site requirement. Separate mounting arrangement shall be provided that shall be supported from handrails provided on boiler platform walkway, if mounting structure is not available.	
5.2.4	Flame proof lighting fixtures will be installed in hazardous area as per area classifications. All highbay fixtures will have vibration damper.	
5.2.5	In general, the type of fixtures, type of luminaries and illumination levels to be achieved will be as per enclosed Annexure-I.	
5.2.6	Switch control shall be provided for controlling lighting fixtures located indoor.	
5.2.7	Lighting panel (LP) for controlling lights with additional provision for manual control shall be provided: Indoor lighting panel: With Timer Outdoor lighting panel: With Timer or Photocell	
5.2.8	Outdoor areas like Fuel oil tank area, open store etc. shall have flood light fixtures mounted on flood light poles.	
5.2.9	Type of luminaries used for lighting of all indoor & Outdoor areas as per Annexure-I. For DC lighting LED type luminaries shall be used.	
5.3	ILLUMINATION DESIGN CALCULATION:	
5.3.1	Lighting design for indoor areas will be done by LUMEN method only. For a given indoor area, number of luminaires is calculated as follows:	
	$\text{Number of luminaires} = \frac{L \times W \times \text{LUX LEVEL (Average)}}{\text{LUMEN} \times \text{COU} \times \text{MF}}$	
	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	
	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.	
	The working plane from the floor level considered at : 0.85 meter	


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<p>The Room Index is calculated by the following formula:</p> $\text{Room Index} = \frac{L \times W}{(L + W) \times \text{MH}}$ <p>where, MH = Mounting height of luminaire.</p> <p>The Reflection Factor (RF) will be considered as given below:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Ceiling (rc)</th> <th style="text-align: center;">Wall (rw)</th> <th style="text-align: center;">Floor (rf)</th> </tr> </thead> <tbody> <tr> <td>For clear areas such as switchgear room/ control room etc</td> <td style="text-align: center;">70</td> <td style="text-align: center;">50</td> <td style="text-align: center;">10</td> </tr> <tr> <td>For Dusty area such as conveyor galleries/tunnels, TPs/ Crusher House etc</td> <td style="text-align: center;">50</td> <td style="text-align: center;">30</td> <td style="text-align: center;">10</td> </tr> </tbody> </table> <p>Values of Maintenance Factor (MF), which includes the luminaire depreciation factor also as per IS-3646, will be considered as given below:</p> <table style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>Air-conditioned clean interiors such as office rooms, Control and Electrical room =</td> <td style="text-align: right;">0.8</td> </tr> <tr> <td>Clean interiors such as office rooms, laboratories, Electrical room =</td> <td style="text-align: right;">0.75</td> </tr> <tr> <td>Industrial areas with normal interiors such as workshops=</td> <td style="text-align: right;">0.7</td> </tr> <tr> <td>Industrial areas with dusty interiors such as Boiler, ESP areas =</td> <td style="text-align: right;">0.6</td> </tr> <tr> <td>Industrial areas with very dusty interiors =</td> <td style="text-align: right;">0.5</td> </tr> <tr> <td>Indoor area non-AC(fluorescent fixture) =</td> <td style="text-align: right;">0.61\$</td> </tr> </tbody> </table> <p>\$: (0.7x0.87=0.61, where 0.87 is the ambient temperature correction factor for fluorescent fixture at 50 degree C in motionless air.</p> <table style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>Ambient temperature considered for above correction factor</td> <td style="text-align: right;">50</td> <td style="text-align: right;">deg C</td> </tr> </tbody> </table> <p>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.</p> <p>Average maintenance factor for outdoor and road lighting : 0.6</p> <p>For outdoor lighting and road lighting ratio of minimum to average illumination will not be less than 0.25 and for minimum to maximum will not be less than 0.05.</p> <p>5.4 LIGHTING SYSTEM DESCRIPTION</p> <p>Lighting system will be provided with AC normal, AC emergency and DC emergency as listed against various areas as per Annexure-II enclosed.</p> <p>The sources of power lighting are as below :</p> <ol style="list-style-type: none"> (i) 415V AC Normal (ACN) Supply from different station PMCCs /MCCs (ii) 415V AC Emergency (ACE) Supply from Emergency Board (iii) 220V DC Emergency Supply from DC Distribution Board (iv) 24V AC Supply for maintenance <p>For main plant area normally all AC luminaries will be in service on normal AC supply.</p> <p>Approximately distribution of AC Luminaries on AC normal and AC emergency shall as below:</p> <table style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>AC Normal (ACN) supply:</td> <td style="text-align: right;">80 %</td> </tr> <tr> <td>AC Emergency (ACE) supply:</td> <td style="text-align: right;">20 %</td> </tr> </tbody> </table> <p>Normally all DC luminaries shall be 'ON'. Upon failure of AC supply, DC luminaries will be 'ON' through DC supply. On restoration of AC Emergency supply through DG, ACE luminaries will be put-on.</p>				Ceiling (rc)	Wall (rw)	Floor (rf)	For clear areas such as switchgear room/ control room etc	70	50	10	For Dusty area such as conveyor galleries/tunnels, TPs/ Crusher House etc	50	30	10	Air-conditioned clean interiors such as office rooms, Control and Electrical room =	0.8	Clean interiors such as office rooms, laboratories, Electrical room =	0.75	Industrial areas with normal interiors such as workshops=	0.7	Industrial areas with dusty interiors such as Boiler, ESP areas =	0.6	Industrial areas with very dusty interiors =	0.5	Indoor area non-AC(fluorescent fixture) =	0.61\$	Ambient temperature considered for above correction factor	50	deg C	AC Normal (ACN) supply:	80 %	AC Emergency (ACE) supply:	20 %
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<p>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 DG room, in addition to DC emergency lighting, 100% AC emergency lighting will be provided.</p>																				
<p>Lighting level by DC emergency lighting will be provided to meet functional/ operational requirements. DC fixtures will be located at strategic locations such as near entrance, staircase, landings etc. for safe personnel movement during emergency.</p>																				
<p>In off-site areas/odd locations, for safe movement of personal during emergency, self contained battery operated emergency lighting units (ELUs) is envisaged.</p>																				
<p>The junction boxes shall be of FRP weather proof type. 650 Volt grade multiday terminal blocks complete with screws, nuts, washers and marking strips shall be furnished for connection of incoming/outgoing wires in the junction boxes. The Junction box shall be suitable for mounting on wall/column/poles/masts.</p>																				
<p>5.4.1 AC Normal Lighting Systems:</p>																				
<p>AC Normal lighting fixtures are fed through a number of conveniently located AC Lighting panel (ACLP) which are fed from Lighting Distribution Board (LDB).</p>																				
<p>LDBs consisting of dry type isolation transformer housed in LDB with proper separation from distribution panels as per details indicated below is envisaged:</p>																				
<table border="0"> <tr> <td>Transformer rating:</td> <td>50 / 100 kVA</td> </tr> <tr> <td>Transformer voltage ratio:</td> <td>415 / 415 Volt, taps of +5% to -5% in steps of 2.5%.</td> </tr> <tr> <td>Transformer type:</td> <td>Encapsulated</td> </tr> <tr> <td>Distribution Panel type:</td> <td>Single front fixed type</td> </tr> <tr> <td>LDB Configuration:</td> <td>One incomer</td> </tr> <tr> <td>Incomer type:</td> <td>TPN MCCB</td> </tr> <tr> <td>Incomer rating:</td> <td>As per lighting transformer rating</td> </tr> <tr> <td>Outgoing feeder type:</td> <td>TPN MCCB</td> </tr> <tr> <td>Outgoing feeder rating:</td> <td>63A</td> </tr> </table>			Transformer rating:	50 / 100 kVA	Transformer voltage ratio:	415 / 415 Volt, taps of +5% to -5% in steps of 2.5%.	Transformer type:	Encapsulated	Distribution Panel type:	Single front fixed type	LDB Configuration:	One incomer	Incomer type:	TPN MCCB	Incomer rating:	As per lighting transformer rating	Outgoing feeder type:	TPN MCCB	Outgoing feeder rating:	63A
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Outgoing feeder type:	TPN MCCB																			
Outgoing feeder rating:	63A																			
<ul style="list-style-type: none"> • AC LDB shall be 3Ph, 4Wire, 50Hz effectively grounded System. • AC LDB shall have 20% spare feeders. • Voltage drop at the fixture from the LDB bus shall not exceed 3%. 																				
<p>AC normal lighting panel as per details given below is envisaged:</p>																				
<table border="0"> <tr> <td>Incomer type:</td> <td>TPN MCB WITH</td> </tr> <tr> <td>Incomer rating:</td> <td>63A</td> </tr> <tr> <td>Outgoing feeder type:</td> <td>SPN MCB</td> </tr> <tr> <td>Outgoing feeder rating:</td> <td>20A</td> </tr> <tr> <td>Short circuit rating:</td> <td>10kA</td> </tr> <tr> <td>ELCB in Incomer:</td> <td>Yes</td> </tr> </table>			Incomer type:	TPN MCB WITH	Incomer rating:	63A	Outgoing feeder type:	SPN MCB	Outgoing feeder rating:	20A	Short circuit rating:	10kA	ELCB in Incomer:	Yes						
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Incomer type:	TPN MCB																			
Incomer rating:	63A																			
Outgoing feeder type:	TPN MCB																			
Outgoing feeder rating:	20A																			
Short circuit rating:	9kA																			
ON/ OFF control	With Timer & photocell																			
<ul style="list-style-type: none"> • AC NLP shall have 20% spare feeders. • 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. • Load on each lighting circuit and single phase receptacle circuit shall be limited to about 1500W and the number of luminaries connected to lighting circuit shall be limited to about fifteen (15). 																				

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<p>5.4.2 AC Emergency Lighting Systems: AC Emergency lighting fixtures are fed through a number of conveniently located AC Lighting panel (ACELP) which are fed from AC Emergency Lighting Distribution Board (ELDB). ELDBs consisting of encapsulated, dry type isolation transformer housed in ELDB with proper separation from distribution panels as per details indicated below is envisaged:</p> <p>Transformer rating: 50 / 100 kVA Transformer voltage ratio: 415 / 415 Volt, taps of +5% to -5% in steps of 2.5%. Transformer type: Encapsulated Distribution Panel type: Single front fixed type LDB Configuration: One incomer Incomer type: TPN MCCB Incomer rating: As per lighting transformer rating Outgoing feeder type: TPN MCCB Outgoing feeder rating: 63A</p> <ul style="list-style-type: none"> • AC ELDB shall be 3Ph, 4Wire, 50Hz effectively grounded System. • AC ELDB shall have 20% spare feeders. <p>AC emergency lighting panel as per details given below is envisaged:</p> <p>Incomer type: TPN MCB Incomer rating: 63A Outgoing feeder type: SPN MCB Outgoing feeder rating: 20A Short circuit rating: 10kA ELCB in Incomer: Yes</p> <p>5.4.3 DC Emergency Lighting Systems: DC Emergency lighting fixtures fed through suitable numbers of conveniently located DC Emergency Lighting panel (DCELP) which are fed through DC Lighting Distribution Board (DCLDB). The DCLDB shall be fed from DCDB. The emergency lighting fixtures connected to this system shall remain 'ON' all the time from DC supply system.</p> <p>DCLDBs as per details given below is envisaged:</p> <p>Distribution Panel type: Single front fixed type DC Incomer type: DP Switchfuse unit with contactor DC Incomer rating: 125A Outgoing feeder type: DP Switchfuse unit Outgoing feeder rating: 32A</p> <p>DCLPs as per details given below is envisaged:</p> <p>Incomer type: DP MCB Incomer rating: 32A Outgoing feeder type: DP MCB Outgoing feeder rating: 20A</p> <p>5.4.4 The LDBs shall be made of sheet steel of 2 mm thickness for load bearing members and 1.6 mm for other members 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. Where as the DOP for LP will be IP-54 for indoor and IP-55 with canopy for outdoor. Lighting distribution boards & panels shall be powder coated with color shade RAL7035.</p>		

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5.4.5	24V AC Supply system:	
	Each 24V AC supply module will have one no. dry type two winding, 1 phase transformer and necessary terminals for incoming and outgoing connections. The 240V terminals of 24V AC supply module will be fed from AC emergency lighting panels (ACELP). Details of 24V supply modules shall be as given below:	
	Module type:	Portable type / Fixed type
	Enclosure:	Steel sheet of 2MM Thickness with louvers
	Transformer rating:	500 VA
	Transformer voltage ratio:	240 / 24 Volt
	Primary side isolation:	DP MCB with HRC fuse
	Isolator rating:	16A
	HRC fuse rating:	6A
	Secondary side isolation:	SPN MCB with HRC fuse
	Isolator rating:	6A
	HRC fuse rating:	16A
	Fixed type 24V supply modules shall be provided in following areas:	
	Boiler/ HRSG area:	Near inspection manholes on boiler platforms and boiler drum.
	TG Building:	Near HP & LP heaters, turbine flash tank, blow down tank, near condenser water box and near bus duct termination of generator end.
	ESP area:	Near inspection manholes.
	other area:	Near Deaerator
	Suitable numbers of 24V portable halogen lamp unit along with flexible copper cable shall also be supplied as per details below:	
	Lamp wattage:	40 W
	Cable size:	2.5 sq. mm
	Cable length:	20 meter
5.4.6	Emergency EXIT lamps:	
	Emergency exit lamps backed up by battery shall be provided at all door locations and 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 4 hours backup capacity.	
5.4.7	ELUs shall contain maintenance free Ni-Cd battery with 4 hours backup capacity. Each ELU will have battery charger and 2x9W fluorescent lamp with test switch.	
5.5	STREET LIGHTING / OUTDOOR LIGHTING	
5.5.1	The roads within BHEL scope as per contract will be considered for lighting.	
5.5.2	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.	
5.5.3	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:	
	Material:	Octagonal Poles HT Steel Conforming to grade S355JO.
	Base Plate:	Fe 410 conforming to IS 226 / IS 2062
	Foundation Bolt:	EN.8 grade
	The Octagonal Poles shall be in single section (upto 7.5/9/11 Mtr). The poles shall be hot dip galvanized as per IS 2629 / IS 2633 / IS 4759/ BS EN ISO 1461 standards with average coating thickness of 70 micron.	

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<p>The Octagonal Poles shall be designed to withstand the maximum wind speed of 47 meter/ sec. The top loading i.e. area and the weight of fixtures are to be considered to calculate maximum deflection of the pole and the same shall meet the requirement of BS: 5649 Part VI 1982/ BSEN 40-3:2000, pr EN-10-3-3.</p> <p>The pole shaft shall have octagonal cross section and shall be continuously tapered with single longitudinal welding. There shall not be any circumferential welding joint.</p> <p>The octagonal Poles shall have door of approximate 500 mm length at the elevation of 500 mm from the Base plate. The door shall be vandal resistance and shall be weather proof to ensure safety of inside connections. The door shall be flush with the exterior surface and shall have suitable locking arrangement. There shall also be suitable arrangement for the purpose of earthing. The pole shall be adequately strengthened at the location of the door to compensate for the loss in section. Separate lighting pole junction box shall be provided along with octagonal pole.</p> <p>The galvanized mounting bracket shall be supplied along with the Octagonal Poles for installation of the luminaries.</p> <p>The poles will be located 1.5 M away from the road edge. The buried cable will run in hume pipe (100 mm dia) wherever it is crossing the roads.</p> <p>5.5.4 High mast will be 30 meter high, hot dip galvanised and polygonal shaped. Total 25 Nos. high mast shall be provided for the project. The location of high mast will be decided during detailed engineering.</p> <p>Each Lighting Mast shall be 30 M high, complete with the following accessories.</p> <ul style="list-style-type: none"> • High mast shaft in two/three section, hot dip galvanised • Head frame, steel wire rope & double drum winch. • Galvanised Lantern carriage arrangement • Integral power tool installed inside base compartment for its operation. • Foundation bolts • Luminaires • Aviation obstruction light with 2 nos. LED lamps. • Control panel • Power & control cables and cabling accessories required for the installation. • Special tools & tackles <p>The High mast shall be of continuously tapered, polygonal cross section, at least 20 sided, presenting a good and pleasing appearance and shall be based on proven design to give an assured performance, and reliable service. The entire fabricated mast shall be hot dip galvanized, internally and externally, having a uniform average thickness of atleast 85 microns.</p> <p>An adequate door opening shall be provided at the base of the mast and the opening shall permit clear access to equipment like winches, cables, plug and socket, etc. and also facilitate easy removal of the winch.</p> <p>A fabricated Lantern Carriage shall be provided for fixing and holding 12 nos flood light fittings and its control gearboxes. The lantern carriage shall be of steel tube construction, the tubes acting as conduits for wires, with holes fully protected by grommets.</p> <p>The winch shall be completely self-sustaining type, without the need for brake shoe, springs or clutches. Each driving spindle of the winch shall be positively locked when not in use, gravity activated PAWLS. Individual drum also shall be operated for fine adjustment of lantern carriage. The minimum-working load shall be not less than 750 kg. The winch shall be selflubricating type by means of an oil bath and the oil shall be readily available grades of reputed producers.</p> <p>The suspension system shall essentially be without any intermediate joint and to consist of only non-corrodible stainless steel of AISI 316 grade. The breaking load of each rope shall not be less than 2350 kg, giving a factor of safety of over 5 for the system at full load. The thimbles shall be secured on ropes by compression splices.</p> <p>A suitable, high-powered, electrically driven, internally mounted power tool with motor, with manual over ride shall be supplied for the raising and lowering of the lantern carriage for maintenance purposes. The power tool shall be of single speed, provided with a motor of the required rating. The power tool shall be supplied complete with suitable control.</p>		

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5.6	LOW VOLTAGE POWER SERVICES	
5.6.1	Different type of receptacles as per details below will be provided: (i) Decorative receptacle: At least 01 number 5/15A, 3-Pin, 230V AC decorative socket will be provided in office, store, cabin etc. In service building, atleast 4 nos. 5 Amp plug points shall be provided in each cubicle (ii) Industrial receptacle: At least 01 number 20A, 3-Pin, 240V AC industrial type receptacles with switch will be provided at suitable location in generation building/industrial area. The receptacles shall be provided at interval of 50m or part thereof. All receptacles will be controlled with a switch. In hazardous area receptacles will be of flameproof type. (iii) Welding receptacle: 63 Amp, 415 V, 3 phase welding receptacle with isolating switch shall be provided in plant area. The receptacles shall be provided in all the floors of power house building at 50 m interval along A-row and B-row. Further in Boiler at alternate floors, welding receptacles shall be provided. In ESP top platform welding receptacle at 100 m interval shall be provided. In chimney at alternate floors, welding receptacles shall be provided. In outdoor locations, in the vicinity of major equipment, welding receptacles shall be provided. In pump houses, water treatment plant, compressor house, coal crushers, mill bay, coal transfer towers, ash handling plant, fuel oil pump house, H2 plant, GIS building, Switchyard, etc., minimum one welding receptacle shall be provided. Maximum 04 nos. receptacles will be fed through one feeder. In hazardous areas these receptacle will be located in MCC room at interval of 50m. In Transformer yard, 4 nos. 63 Amp welding receptacle and 4 nos. 250 Amp receptacle with MCCB unit shall be provided to extend power for oil filtration units during maintenance.	
5.6.2	Transformer rating for welding distribution board shall be 100kVA. Other construction details shall be identical to AC LDB. Welding distribution boards shall only provided in main plant. For offsite areas, welding receptacles shall be fed directly from nearest ACDB.	
5.6.3	Based on room size, suitable nos. of ceiling fans (1200mm sweep) with Stepped electronic regulator shall be provided in office rooms, store rooms and social buildings which are not covered by air-conditioned or ventilation system. Pedestal fans and wall mounted fans shall also be provided, if required.	
5.6.4	For the maintenance of lighting fixtures within the power house, 4 nos. free standing adjustable aluminium ladder, adjustable from 05M to 10M shall be provided and 3 nos. free standing adjustable aluminium ladder, adjustable from 0.5M to 1.5M shall be provided. For the maintenance of street lights, 01 no. of mini truck mounted adjustable hydraulic lift (for details, refer Annexure-C) shall be provided.	
5.7	WIRING / CONDUITS	
5.7.1	Wiring of lighting system will be done as follows: (i) Wiring installation will be done by multi-stranded, PVC insulated, colour coded wires laid in GI conduits of min. 20 mm dia size (minimum) conforming to IS-9537. The thickness of conduits upto & 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, B phases & neutral respectively and white & grey for DC positive & DC negative circuits respectively. (ii) Conduits will be medium-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 made with bright, cold rolled annealed and electro galvanised mild steel strips and coated with PVC will be used where required. (iv) Conduits in 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.	
(viii)	Maximum 03 numbers of 1-phase receptacles will be loop in & loop out in a circuit.	
5.7.2	Following sizes of 1100 V grade, PVC insulated, single core, stranded copper conductor wires will be used:	
	Lighting Panel to Fixtures:	2.5 sq. mm (Cu)
	Lighting Panel to JB's/ Switches:	2.5 sq. mm (Cu)
	JB's/ switches to Fixtures:	2.5 sq. mm (Cu)
	Panel to First receptacles:	4.0 sq. mm (Cu)
	First receptacles to looping other receptacles:	4.0 sq. mm (Cu)
	In case of only one receptacles in ckt., Panel to receptacles:	4.0 sq. mm (Cu)
	Panel/ JB's to flood light fixtures:	2x2.5 sq. mm (Cu)
5.7.3	Wiring in hazardous area, transformer yard, outdoor area (like Tank area, GT area) will be done using 3C-2.5 sq. mm (Cu), PVC insulated, FRLS PVC sheathed cable.	
5.8	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:	14 SWG GI wire
	Welding receptacles:	GS Flat 25x6 mm
	Street light pole/ flood light pole/ High Mast:	GS Flat 25x3 mm
	Electrode for Pole/ Mast:	1 nos, 20 mm dia MS rod, 3 mtr long
	Street lighting panel:	GS Flat 25x6 mm
5.9	STATUTORY & REGULATORY REQUIREMENT	
	Statutory and regulatory regulation shall be applicable as per Indian Electricity Rule, 1956 with amendment-3 Rule no. 35, 48, 49, 50, 61 & 64 for illumination & low voltage power services.	

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ANNEXURE-I
AVERAGE LUX LEVEL & TYPE OF FIXTURES

S. No.	LOCATION	AVERAGE LUX LEVEL	TYPE OF LIGHTING FIXTURES
01	TG Hall operating floors	200	LED High bay
02	TG hall ground, mezzanine floor	100	LED Medium bay/ LED well glass fixture
03	Boiler Platforms & ESP Platforms	100	LED well glass fixture
04	Switchgear/MCC rooms, Elevator Machine room	200	LED, General Purpose, Industrial Pendant Type.
05	DG room	200	LED High bay/Medium bay/ LED well glass fixture
06	UPS, Battery Charger Room	200	LED, General Purpose, Industrial Pendant Type.
07	Battery Room	200	LED Pendant/ Ceiling Mounted type Corrosion proof.
08	Transformer yard	50	LED flood light fixtures on steel poles/Mast
09	Control Room	400/ 500	Decorative recessed mounted type LED.
10	Control equipment Room	300	Decorative recessed/surface mounted type LED.
11	Office area,	300	Decorative recessed/surface mounted type LED.
12	Service Building, Admin Building	300	Decorative recessed/surface mounted type LED.
13	Air Compressor house	150	LED Medium bay
14	Pump houses, AHU room	150	LED Medium bay/ High bay Fixture
15	Water Treatment Plant, DM Plant	150	LED well glass fixture
16	Chlorination building, Chemical House	150	LED Pendant/ Ceiling Mounted type Corrosion proof.
17	Fuel Oil Pump House	150	HPMV/ LED, well glass, Flame Proof luminaire*
18	Hydrogen Plant	150	HPMV/ LED, well glass, Explosion Proof luminaire*
19	Sea water intake pump house	150	LED, well glass luminaire
20	Main Road	20	LED Street Light on Galvanised Steel Pole
21	Secondary Roads	10	LED Street Light on Galvanised Steel Pole
22	Cable galleries	100	LED well glass fixture
23	Stair case, Passages, Toilets	100	LED, General Purpose, Industrial Pendant Type.
24	Tank area and Outdoor equipment location	20	LED flood light fixtures on steel poles/Mast

Note: * The fixture will be suitable for Division-2, Group IIA/IIB/IIC of hazardous area as per IS-2148.
Decorative type fixtures will be provided for false ceiling areas.
For DC lighting LED type luminaires shall be used.
Medium bay light shall be used if mounting height vary from 5Mtr to 8Mtr

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ANNEXURE-II

LIGHTING & LV POWER SERVICES IN DIFFERENT AREAS

S. No.	AREA	ACN	ACE	DCE	5/15A Socket	20A Socket	63A Socket	ELU \$
01	TG building (Turbine Hall, Switchgear room etc)	Y	Y	Y	Y*	Y	Y	-
02	Ac Plant	Y	Y	-	-	Y	Y	-
03	Boiler platforms & boiler area	Y	Y	Y	-	Y	Y	-
04	ESP platforms & Mill area	Y	Y	Y	-	Y	Y	-
05	ID, FD & PA FAN area	Y	Y	Y	-	Y	Y	-
06	Transformer Yard	Y	Y	Y	-	Y	Y	-
07	ESP control room	Y	Y	Y	Y*	Y	Y	-
08	DG room	-	Y	Y	-	Y	Y	-
09	Compressor house	Y	-	-	Y*	Y	Y	Y
10	Fuel oil PH	Y	-	-	Y*	Y#	Y\$	Y
11	Hydrogen Plant	Y	-	-	Y*	Y#	Y\$	Y
12	Outdoor area	Y	-	-	-	-	-	-
13	Aux. boiler MCC Room	Y	-	-	Y*	Y	Y	Y
14	Service building	Y	-	-	Y*	Y	-	Y
15	Admin building	Y	-	-	Y*	-	-	Y
16	CPU Regeneration Building/ Air Washer Room	Y	-	-	Y*	Y	Y	Y

LEGEND:

ACN:	AC Normal Lighting
ACE:	AC Emergency Lighting
DCE:	DC Emergency Lighting
Y:	YES
Y*:	YES, Only in control room, offices & toilets
Y# :	Flame proof type receptacles
Y\$:	YES, Only in MCC/ SWITCHGEAR ROOM
\$:	Emergency Lighting Unit (ELU) & 5/15A Switch socket for ELU

2 x 660MW UDANGUDI STPP: LIGHTING SYSTEMTentative Locations of Lighting Distribution Boards (LDB)

S.No.	Location	Type	Rating	Quantity
1.	LT Switchgear Room EL+12.0Mtr.	ACN	100 kVA	04
2.	LT Switchgear Room EL+12.0Mtr.	ACN	50 kVA	02
3.	LT Switchgear Room EL+12.0Mtr.	DC	125A	01
4.	Boiler MCC room EL+28.0Mtr.	ACN	100 kVA	04
5.	Boiler MCC room EL+28.0Mtr.	DC	125A	01
6.	ESP Control Room Building	ACN	100 kVA	02
7.	WDB, UNIT-1 MV SWGR ROOM EL 3.5M	ACN	100 kVA	01
8.	WDB, UNIT-1 LV SWGR ROOM EL 12.0M	ACN	100 kVA	02
9.	ADMIN BUILDING	ACN	100 kVA	01
10.	ADMIN BUILDING	ACN	100 kVA	01
11.	SERVICE BLDG	ACN	100 kVA	01
12.	SERVICE BLDG	ACN	100 kVA	01
13.	FUEL OIL PUMP HOUSE	ACN	50 kVA	01
14.	CPU REGENERATION	ACN	100 kVA	01
15.	HYDROGEN GENERATION	ACN	100 kVA	01
16.	DESALINATION & DM PLANT	ACN	100 kVA	01
17.	SEA WATER INTAKE	ACN	100 kVA	01
18.	SEA WATER INTAKE	ACN	50 kVA	01
19.	ETP	ACN	100 kVA	01
20.	CANTEEN	ACN	50 kVA	01
21.	WORKSHOP	ACN	100 kVA	01
22.	CWPH	ACN	100 kVA	01

NOTES:

1. Items mentioned at Sr. no. 1 to 8 are of Unit-1, similar quantity shall be considered for unit-2 also.


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DATA SHEET –A

S. No.	Description	Unit	Value
1.0	SYSTEM DESIGN DATA		
1.1	Design ambient	°C	50
1.2	AC Supply		
a)	Rated voltage	V	415
b)	Rated frequency	Hz	50
c)	Voltage variation (permissible)	%	+10% to -10%
d)	Frequency variation (permissible)	%	+3% to -5%
e)	Combined voltage & frequency variation (sum of absolutes permissible)	%	10%
f)	System fault level & duration	kA, sec.	50kA for 1 sec.
1.3	DC Supply		
a)	Rated voltage	V	220
b)	Voltage variation (permissible)	%	+10% to -15%
c)	System fault level & duration	kA, sec.	25kA for 1 sec.
2.0	SCOPE OF SYSTEM DESIGN ENGINEERING		Included in vendor's scope
3.0	LIGHTING CONCEPT		
3.1	Types of supplies considered (other than AC Normal)		
a)	AC emergency		<input checked="" type="checkbox"/> Yes [] No
b)	DC emergency		<input checked="" type="checkbox"/> Yes [] No
c)	DC Normal		[] Yes <input checked="" type="checkbox"/> No
3.2	Diversity Factor for Sockets	%	25%
4.0	LUMINAIRES, LAMPS & ACCESSORIES		
4.1	Type of false ceiling for recessed fluorescent luminaire		Grid False ceiling (600mm X 600mm) / Aluminium false ceiling (for Control Room).
4.2	Degree of protection for drip proof luminaires		IP65
4.3	Flame proof luminaires		
a)	Hazardous area classification		IS-2148 Zone II Group-IIA, IIB & IIC
b)	Degree of protection		IP65


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c)	Mounting type for well glass		<input checked="" type="checkbox"/> Eye-bolt <input type="checkbox"/> MS Galvanised Strap
4.4	Non-integral control gear box for HPMV lamps		
a)	Material		<input type="checkbox"/> CRCA sheet steel <input checked="" type="checkbox"/> Cast Aluminium LM6
b)	Sheet thickness	mm	<input type="checkbox"/> 2 for CRCA sheet <input checked="" type="checkbox"/> 3 for Cast Aluminium LM6
c)	Degree of protection		IP55
d)	Surface treatment		<input checked="" type="checkbox"/> Painted <input type="checkbox"/> Galvanized
e)	If painted		
	Paint shade		during detailed engineering
	Minimum paint thickness (DFT)	micron	50
4.5	Lamps		
a)	Type of Fluorescent Lamps		<input checked="" type="checkbox"/> Cool Daylight <input checked="" type="checkbox"/> White Light
b)	Type of cap for incandescent lamp		<input type="checkbox"/> Screw type <input type="checkbox"/> Pin type <input checked="" type="checkbox"/> Not Applicable
c)	Type of HPMV lamp		<input checked="" type="checkbox"/> Clear <input type="checkbox"/> Fluorescent powder coated
d)	Type of cap for HPMV lamp		Screw type
e)	Type of beam for		
	HPMV lamps		<input type="checkbox"/> Short beam <input type="checkbox"/> Long beam <input checked="" type="checkbox"/> Both
4.6	Emergency Lighting Unit		
a)	Lamp type		<input type="checkbox"/> FLT <input type="checkbox"/> CFL <input checked="" type="checkbox"/> LED
b)	Nos. of Lamp		2
c)	Lamp wattage	W	9
d)	Lumen output of lamp at rated voltage	Lumen	To furnished by Vendor
e)	Type of battery (Rechargeable type)		Ni-Cd
f)	AH capacity of battery	AH	To furnished by Vendor
g)	Battery voltage	V	To furnished by Vendor
h)	Battery backup time	Hr	4
i)	In built charger		Yes
4.7	Exit Sign		


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a)	Lamp type		FLT / LED
b)	Nos. of Lamp		1
c)	Lamp wattage	W	20
d)	Lumen output of lamp at rated voltage	Lumen	To furnished by Vendor
e)	Type of battery		Ni-Cd
f)	AH capacity of battery	AH	To furnished by Vendor
g)	Battery voltage	V	To furnished by Vendor
h)	Battery backup time	Hr	4
4.8	24V AC Supply Module (Fixed type & portable type)		
a)	Enclosure		
	Enclosure material		CRCA sheet steel
	Enclosure thickness	mm	2 mm for CRCA sheet steel
	Louvers provided		<input checked="" type="checkbox"/> Yes [] No
b)	Surface treatment		[] Painted <input checked="" type="checkbox"/> Galvanized
c)	If galvanized		
	Process		Hot dip
	Weight of zinc	g/m ²	460 gm / mm ² (65 microns)
d)	Transformer		
	Rating	VA	500
	Voltage ratio & Current Rating	V	240V/24V [6A/16A]
	Class of insulation		Class F, temperature rise limited to Class-B
e)	24V Hand lamp unit		
	Lamp type		<input checked="" type="checkbox"/> Halogen [] LED
	Lamp wattage	W	40
f)	No. of outgoing sockets		4
g)	Whether cord coiling arrangement provided		<input checked="" type="checkbox"/> Yes air cooled [] No
5.0	Junction Box		
a)	Enclosure material		FRP
b)	Enclosure thickness	mm	3 (min.)
c)	Galvanized (applicable for CRCA sheet)		NOT APPLICABLE
d)	Degree of protection		IP-55 (indoor) / Weather proof IPW-65 with canopy for outdoor area


**TECHNICAL SPECIFICATION FOR
LIGHTING FIXTURES, LAMPS &
MISCELLANEOUS ITEMS**

SPECIFICATION NO. PE-TS-435-558-E006

VOLUME II

SECTION - I

2 X 660MW UDANGUDI STPP STAGE-I

REVISION 0 | DATE: 10.03.2022

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6.0	Industrial/ Welding Receptacle		
a)	Enclosure material		Thermoplastic
b)	Enclosure thickness	mm	3 (min.)
c)	Surface treatment		NOT APPLICABLE
d)	If galvanized		
	Process		NOT APPLICABLE
	Weight of zinc	g/m ²	NOT APPLICABLE
e)	Degree of protection		IP-55 / IP 65 for Flameproof (used in hazardous area)
7.0	Decorative Receptacle		
a)	Enclosure material		Thermoplastic
b)	Enclosure thickness	mm	3 (min.)
c)	Surface treatment		NOT APPLICABLE
d)	If galvanized		
	Process		NOT APPLICABLE
	Weight of zinc	g/m ²	NOT APPLICABLE
e)	Degree of protection		IP-20 / IP 65 for Flameproof (used in hazardous area)
8.0	Switch Box		
a)	Enclosure material		<input type="checkbox"/> FRP <input checked="" type="checkbox"/> CRCA Sheet.
b)	Enclosure thickness		2 MM CRCA sheet with 6mm thick Bakelite cover
c)	Galvanized		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
d)	Painted		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
e)	Degree of protection		IP-55
9.0	Conduit (Flexible)		
a)	Type		Cold rolled annealed and electro galvanised mild steel strips and coated with PVC
b)	Size	mm	20
c)	Standard length	m	25 to 50
d)	Thickness of Galvanization	microns	25 (min.)
10.0	Cable Glands		By vendor for all incoming and outgoing cables
a)	Type		Double compression
b)	Material		Brass
c)	Nickel Plating provided		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
d)	Flameproof glands with flameproof equipment		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No


732157/2022/PS-PEM-EL


**TECHNICAL SPECIFICATION FOR
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11.0	Cable Lugs		By vendor for all incoming & outgoing cable
a)	Type		Crimping type/ ring type
b)	Material		Tinned copper
12.0	LADDERS		
a)	Type		Free standing and wheel mounted both
b)	Material		[] Steel [✓] Aluminium
c)	Duty		[] Heavy [✓] Medium
d)	Surface treatment		[✓] Galvanised [] Painted
e)	Reference Standard		IS: 4571, 3696
13.0	SEARCH LIGHT		Search lights of halogen lamps having adequate coverage shall be provided in watch towers

Note :

1. Detailed luminaire and lamp data shall be provided by vendor after award of contract.
2. Galvanization wherever applicable shall be hot dip galvanized with weight of Zinc as 460g/m² (65micron).

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LIST OF APPLICABLE STANDARDS

ILLUMINATION

Code of practice for interior illumination	IS 3646
Code of practice for industrial lighting	IS 6665
Code of practice for lighting of public thoroughfare	IS 1944

LUMINAIRES


Luminaires	IS 10322
Industrial luminaires with metal reflector	IS 1777
Industrial lighting fittings with plastic reflectors	IS 3287
Decorative lighting outfits	IS 5077
Waterproof electric lighting fittings	IS 3528
Watertight electric lighting fittings	IS 3553
Dust-proof electric lighting fittings	IS 4012
Dust-tight electric lighting fittings	IS 4013
Flameproof electric lighting fittings - well glass & bulk head types	IS 2206
Electric lighting fittings for division 2 areas	IS 8224
General & Safety requirement of Luminaire	IS 1913
General Lighting. LEDs and LED modules Terms and definitions	IS 16101
Self Ballasted LED Lamps for General Lighting Services.	IS 16102
LED modules for General lighting Safety Requirements.	IS 16103
Lamp control gear Part 2 particular	IS 15885(Part 2)
Requirements d.c. or a.c. Supplied Electronic control gear for LED modules	IS 16104

LAMPS

Tungsten filament lamps for domestic and similar general lighting purpose	IS 418
Tubular fluorescent lamps for general lighting service	IS 2418
High pressure mercury vapour lamps	IS 9900
High pressure sodium vapour lamps	IS 9974

LUMINAIRE COMPONENTS

Ballast for fluorescent lamps for switch start circuits	IS 1534
Ballast for high pressure mercury vapour lamps	IS 15882
Capacitors for use in tubular fluorescent high pressure mercury and low pressure sodium vapour discharge lamp circuits	IS 1569
Bi-pin lamp holders for tubular fluorescent lamps	IS 3323

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Methods of measurement of lamp cap temperature rise	IS 8913
Starters for fluorescent lamps	IS 2215
Holders for starters for tubular fluorescent lamps	IS 3324
Cast acrylic sheets for use in luminaires	IS 7569

ASSEMBLED EQUIPMENT AND COMPONENTS

Low voltage switchgear and control gear.	IS 60947
Code of practice for selection, installation & maintenance of switchgear & control gear	IS 10118
Explosive atmospheres	IS 60079
Classification of hazardous areas for electrical installations	IS 5572
Dry type transformers	IS 11171
Electrical Accessories - circuit breakers for over protection for household and similar installations	IS 60898
Low voltage Fuses for voltages not exceeding 1000 V ac or 1500 V dc	IS 13703
Indicator lamps (visual)	IS 1901

POLES, SOCKETS AND OTHER MISCELLANEOUS

Plugs and socket outlets of rated voltage upto and including 250 volts and rated current upto and including 16 amperes	IS 1293
Interlocking switch socket outlet	IS 4160
Electric ceiling type fans and regulators	IS 374
Structural steel (Standard quality)	IS 2062
Danger notice plates	IS 2551
Enclosures for accessories for household and similar fixed electrical installations	IS 14772
General construction in steel - Code of practice	IS 800
Wrought aluminium and aluminium alloy bars, rods, tubes and sections for electrical purposes	IS 5082
Code of practice for phosphating of iron and steel	IS 6005
Colour for ready mixed paints & enamels	IS 5
Recommended practice for hot dip galvanising of iron & steel	IS 2629
Method of testing uniformity of coating on zinc coated articles	IS 2603
Flexible steel conduits for electrical wiring	IS 3480
Conduits for electrical installations	IS: 9537
Scaffolds & ladders - Code of safety	IS: 3696
Aluminium extension ladders	IS: 4571
General Requirement for enclosures for accessories for household & similar fixed electrical installations	IS: 5133

2 X 660MW UDANGUDI STPP STAGE-I

DATA SHEET - B

SL. NO.	DESCRIPTION	MEASURED ELECTRICAL INPUT POWER (W) MAX. VALUE	TOTAL LUMINOUS FLUX (LUMEN) OF LUMINAIRE - MIN. VALUE	MAKE OF LUMINAIRE
	MAIN SUPPLY ITEMS			
1.0	Lighting Luminaires (complete with accessories)			REFER BELOW NOTE 2&3
1.1	Type FC02 (LED)			
1.2	Type FC06 (LED)			
1.3	Type FC26 (LED)			
1.4	Type FC81 (LED)			
1.5	Type FC32 (LED)			
1.6	Type FC07 (LED)			
1.7	Type FC33 (LED)			
1.8	Type FC34 (LED)			
1.9	Type SF63 (LED)			
1.10	Type SF64 (LED)			
1.11	Type SF66 (LED)			
1.12	Type SB11 (LED)			
1.13	Type SB02 (LED)			
1.14	Type SB03 (LED)			
1.15	Type SS62 (LED)			
1.16	Type SS63 (LED)			
1.17	Type SW41 (LED)			
1.18	Type SW42 (LED)			
1.19	Type MW96 (LED)			
1.20	Type MW98 (LED)			
1.21	Type FC30 (LED)			
1.22	Downlighter (LED)			

NOTE :

- 1 Bidder to fill details of luminaires as per parameters mentioned above and furnish Data Sheet - B along with technical offer.
- 2 Lighting designer shall furnish the make of above mentioned luminaires along with MOU as per technical PQR prior to the placement of order.
- 3 Luminaire manufacturer shall furnish the make of above mentioned luminaires prior to the placement of order.

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES1	AC CONTACTORS	1	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	
	AC CONTACTORS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC CONTACTORS	3	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
	AC CONTACTORS	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AC CONTACTORS	5	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
ES2	AC LOAD BREAK SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC LOAD BREAK SWITCH	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AC LOAD BREAK SWITCH	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	
	AC LOAD BREAK SWITCH	4	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	AC LOAD BREAK SWITCH	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
ES3	AC MCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	AC MCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	AC MCCB	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	
	AC MCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC MCCB	5	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AC MCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
ES4	ACDB/ DCDB DRAWOUT TYPE	1	EC05	ELECTRO CONTROLS & DEVICES	M/S ELECTRO CONTROLS & DEVICES, F-41, SITE-C, SURAJPUR INDUSTRIAL AREA GREATER NOIDA UTTAR PRADESH :201308	Mr. Sanjay Sharma (Chief Promoter) 0120-2569487, 2560100,2560300	
	ACDB/ DCDB DRAWOUT TYPE	2	KM1	KMG ATOZ SYSTEMS	C-49, SECTOR-81-NOIDA-201305	120-4207920, 08527897328	
	ACDB/ DCDB DRAWOUT TYPE	3	E1019	ASIATIC	A-58 NARAINA IND. AREA, PHASE-I , NEW DELHI 110028	011 - 25796330, 25796617	
	ACDB/ DCDB DRAWOUT TYPE	4	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	ACDB/ DCDB DRAWOUT TYPE	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	ACDB/ DCDB DRAWOUT TYPE	6	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	ACDB/ DCDB DRAWOUT TYPE	7	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	ACDB/ DCDB DRAWOUT TYPE	8	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	
ACDB/ DCDB FIXED TYPE	ACDB/ DCDB FIXED TYPE	1	EC05	ELECTRO CONTROLS & DEVICES	M/S ELECTRO CONTROLS & DEVICES, F-41, SITE-C, SURAJPUR INDUSTRIAL AREA GREATER NOIDA UTTAR PRADESH :201309	Mr. Sanjay Sharma (Chief Promoter) 0120-2569487, 2560100,2560300	
	ACDB/ DCDB FIXED TYPE	2	J01	JASPER ENGINEERS PVT. LTD.	A-23, SECTOR - 8, NOIDA-201301	0120-4033520/533	
	ACDB/ DCDB FIXED TYPE	3	JC01	JACKSON ENGINEERS	A-43, HOSEIRY COMPLEX, OPPOSITE NSEZ, NOIDA-201305	0120-4302600, 2568923,27	
	ACDB/ DCDB FIXED TYPE	4	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	ACDB/ DCDB FIXED TYPE	5	KM1	KMG ATOZ SYSTEMS	C-49, SECTOR-81-NOIDA-201305	120-4207920, 08527897328	
	ACDB/ DCDB FIXED TYPE	6	E1019	ASIATIC	A-58 NARAINA IND. AREA, PHASE-I , NEW DELHI 110028	011 - 25796330, 25796617	

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ES5	ACDB/ DCDB FIXED TYPE	7	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	ACDB/ DCDB FIXED TYPE	8	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	ACDB/ DCDB FIXED TYPE	9	E1210	ENPRO ENGG.	NO.995P, DIAMOND PLAZA, 2ND FLOOR, 12TH MAIN ROAD, ANNA NAGAR, CHENNAI-40	044 – 42611526 / 42170338 / 26262716	
	ACDB/ DCDB FIXED TYPE	10	A01	ASSOCIATED SWGR & PROJ. LTD.	C-10, UPSIDC, INDUSTRIAL AREA, SITE-IV, KASNA ROAD, GREATER NOIDA-201306	0120-4294618,19,20 Asplho@gmail.com	
	ACDB/ DCDB FIXED TYPE	11	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	ACDB/ DCDB FIXED TYPE	12	E1043	ECS PRIVATE LTD	7/47, Site 2, Upsidc Ind Area, Loni Road, MOHAN Nagar, Ghaziabad, Uttar Pradesh 201007	098 10 217990	
	ACDB/ DCDB FIXED TYPE	13	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	ACDB/ DCDB FIXED TYPE	14	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	ACDB/ DCDB FIXED TYPE	15	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	
	ACDB/ DCDB FIXED TYPE	16	E1080	KHOKHAR ELECT. PVT LTD.	C-44, SEC-63, NOIDA-201307	120- 654 5452	
	ACDB/ DCDB FIXED TYPE	17	VC01	VIDHYUT CONTROLS (INDIA) PVT. LTD.	M/S VIDHYUT CONTROL (I) PVT.LTD. D-12 & 13, SECTOR-17, KAVI NAGAR INDL.AREA,GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA	0120-4186400, 0120-4186423, 8527005590(DK GUPTA)	
ES6	AIR CIRCUIT BREAKER	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AIR CIRCUIT BREAKER	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	
	AIR CIRCUIT BREAKER	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AIR CIRCUIT BREAKER	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	AIR CIRCUIT BREAKER	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
ES7	AUXILIARY RELAYS	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	AUXILIARY RELAYS	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	AUXILIARY RELAYS	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDD, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
	AUXILIARY RELAYS	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	
	AUXILIARY RELAYS	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	
ES8	BIMETAL RELAYS	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	BIMETAL RELAYS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	BIMETAL RELAYS	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	
	BIMETAL RELAYS	4	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
ES9	BUCHHOLZ RELAY	1	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	BUCHHOLZ RELAY	2	E1020	ATVUS INDUSTRIES	689, BLOCK 'O', NEW ALIPORE, CALCUTTA-700053	(91)-(33)-24001101 / 9885 sales@atvus.in	
	BUCHHOLZ RELAY	3	E1070	INSTRUMENTS & CONTROLS	146,GIDC IND.ESTATE,MAKARPURA, VADODRA-390010	0265-2642729	
ES10	CABLE CLAMPS & CABLE TIES	1	E1045	ELECTROMAC IND.CORPN.	27/28 AF,NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E), MUMBAI-400059	91-22-28324829 / 66919034/ Mr. Devang Patel/ 91-9867074600 devang@electromaclands.com	
	CABLE CLAMPS & CABLE TIES	2	I01	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
	CABLE CLAMPS & CABLE TIES	3	N05	NOVOFLEX MARKETING PVT. LTD.	RAIKVA' - 5TH FLOOR, UNIT-6 3A, RAM MOHAN MULLICK GARDEN LANE KOLKATA - 700 010	Phone: +91 33 2372 0088 Email: sales@novoflex.co.in, novoflexcal@vsnl.net	
	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	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES11	CABLE GLANDS	2	E1017	ARUP ENGG & FOUNDRY 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	
ES13	D.C. MCCB	1	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
	D.C. MCCB	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	D.C. MCCB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	D.C. MCCB	4	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	
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	314-3175 SHAH 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	
ES15	JELLY FILLED CABLES	1	D01	DELTON SALES LTD.	DELTON HOUSE 4801,BHARAT RAM ROAD,24DARYAGANJ N.DELHI-110002	3273905-8,3262517	
	JELLY FILLED CABLES	2	H01	HINDUSTAN CABLES	A-40 ASIAN GAMES VILLAGE RANJIT SINGH BLOCK NEW DELHI-110049	011-26493673	
	JELLY FILLED CABLES	3	E1096	TELELINK-NICCO	NICCO HOUSE 2,HARE STREET,CALCUTTA-700001	91-033-66285000	
	JELLY FILLED CABLES	4	E1151	USHA BELTRON LTD.	TATISILWAI , ranchi- 835105	91 651 415 897, 415 816	
ES16	GI CONDUITS	BIS APPROVED MAKE					
ES17	GI CONDUIT (EPOXY PAINTED)	BIS APPROVED MAKE					
ES18	FLEXIBLE CONDUITS (LEAD COATED)	1	P03	PLICA INDIA PVT. LTD.	V.P.AGARWAL MANAGING DIRECTOR, PLICA INDIA PVT. LTD. 149, MODEL TOWN EAST GHAZIABAD - 201009	M - 9810052131 / 0120-4563979 / 9810557567 Mail: agr@plicaindia.com	
ES19	FLEXIBLE CONDUIT (PVC COATED)	REPUTED MAKE					
ES20	DC CONTACTORS	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	DC CONTACTORS	2	E1030	BHEL (BHOPAL)	HEAVY ELECTRICAL PLANT		
	DC CONTACTORS	3	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	
	DC CONTACTORS	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	DC CONTACTORS	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	
	DC CONTACTORS	6	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER

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	DC CONTACTORS	7	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
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, SARKHEJ-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	
	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	FOR CONTROL TRANSFORMER ONLY
ES23	LT- CURRENT TRANSFORMER	1	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	
	LT- CURRENT TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LT- CURRENT TRANSFORMER	3	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	
	LT- CURRENT TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	LT- CURRENT TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3, JI POKHRAN RD	5341779.5427041	
	LT- CURRENT TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A, CHAKALA ROAD ANDHERI(E), MUMBAI- 99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	LT- CURRENT TRANSFORMER	7	E1128	SILKAANS ELECT.MFG.CO.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	
	LT- CURRENT TRANSFORMER	8	E1111	PRAYOG ELECTRICALS PVT. LTD.	GROUND FLOOR, THAKORE INDUSTRIAL COMPOUND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMBIKA TEMPLE, MUMBAI Mumbai - 400086, Maharashtra, India	91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR)	
	LT- CURRENT TRANSFORMER	9	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	

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	LT- CURRENT TRANSFORMER	10	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES24	LT- POTENTIAL TRANSFORMER	1	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	
	LT- POTENTIAL TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LT- POTENTIAL TRANSFORMER	3	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	
	LT- POTENTIAL TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELETRIKS 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	
	LT- POTENTIAL TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD	5341779,5427041	
	LT- POTENTIAL TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	LT- POTENTIAL TRANSFORMER	7	E1128	SILKAANS ELECT.MFG.CO.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	
	LT- POTENTIAL TRANSFORMER	8	E1111	PRAYOG ELECTRICALS PVT. LTD.	GROUND FLOOR, THAKORE INDUSTRIAL COMPUND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMBIKA TEMPLE,MUMBAI Mumbai - 400086, Maharashtra, India	91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR)	
	LT- POTENTIAL TRANSFORMER	9	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES25	DC SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	DC SWITCH	2	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	DC SWITCH	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	
ES26	DISTRIBUTION BOX	1	SR01	M/S SHRENIK & CO.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213		
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	CO1	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	

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	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	
ES30	GALVANISING	1		Jenco Industrial Corporation	Chincholi Bunder Khkar Road Near Link Road Devruwadi Malad (W) Mumbai 400064		
	GALVANISING	2		National Galvanizing Company	66, Barrackpore Kamarhatt Trunck Road Calcutta-700058		
	GALVANISING	3		Sigma Galvanising Pvt. Ltd.	Plot No.C-169, TTC, MIDC Ind Area Navin Mumbai-400705	8725402,8725765	
	GALVANISING	4		B.P. Projects PVT LTD	167A, Vivekananda Road Kolkata-700006	033 2553 1254	
	GALVANISING	5		Standard Galvanisers	Makardah Road, Kabar Para, Bankra, Howrah -711403	28756318/28741986/28725402/28725765	
	GALVANISING	6		Steel Products	National Highway No. 6, Chamrail, Kona, Howrah-711114		
	GALVANISING	7		Unitech Fabricators & Engineers Pvt. Ltd.	Village- Ajab Nagar, P.O. -Molla Simla, P.S. - Singur, Dist - Hoogly, Pin-712223	022 -27686606/ 1907	
	GALVANISING	8		Shivam Engineers & Fabricators	A0-282-284, Industrial Area, South Side of G.T. Road, Ghaziabad, U.P.		
	GALVANISING	9		B.G. Shirke Construction Technology Pvt. Ltd	72-76, Mundhawa, Pune - 401 036		
	GALVANISING	10		Galbro Ispat Galvanizers Pvt. Ltd.	GUT 11 AND 12, OPP. Kudus Steel,Rolling Mill, Wada, Thane , Mumbai		
	GALVANISING	11		Eros Metals	G-97, MIDC, Bhutibori , Nagpur		
	GALVANISING	12		Industrial Perforation (India) Pvt. Ltd.	Ganganagr, Katakhal, Kolkata-700132		
	GALVANISING	13		Indmark Formtech Pvt. Ltd.	Phase - 3, E - 11 / 1, M. I. D. C., Chakan, Pune - 410 501, Maharashtra, India.		
	GALVANISING	14		Namdhari Industrial Traders Pvt. Ltd.	Village Latton Dana, Chandigarh Road, Ludhiana		
	GALVANISING	15		Neha Galvaniser	Jalan Industrial Estate, Gate No-1, 1st Right Choise Lane, Near N.G-6, Jangalpur, PO Domjur Howrah - 700071, West Bengal, India		
	GALVANISING	16		Patny Systems (P) Ltd.	Unit-IV, Sy No. -228/9, Plot No. 6, IP Kuchavaram, Toopran(M) Dist.- Medak, Telegana - 502336		
	GALVANISING	17		Parmar Metal Company	Survey No.207,Veraval (Shapar) Dist. Rajkot, India.		
	GALVANISING	18		Rukmani Electrical & Components Pvt Ltd	Urla Industrial Area, Urla Sarora Road, Raipur- 493 221 (Chhattisgarh)		
	GALVANISING			Rukmani Fab & Gal Pvt Ltd	Shankharidaha Baniyarah, Jalan Industrial Complex, Gate no.3, Lane no. 4, Domjur, Howrah , W.B. - 711411		
	GALVANISING	19		DMP Projects Pvt.Ltd.	Dulagarh Industrial Park , PS-Sankrail , Howrah -711302		
GALVANISING	20		Vinfab Engineers India Private Limited	Gut no. 224/1 &2 Bhiwandi Wada State Highway, Village khupri, Dist. Thane, Maharashtra -421303			

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	GALVANISING	21		Saral Projects & Processors	B-1, Industrial Area, Site-II, Amawan Road Rae Bareli		
	GALVANISING	22		Brahampuri Steels Limited	172 (F) Industrial Area, Jhotwara, Jaipur-302013		
	GALVANISING	23		Indiana Gratings PVT. LTD	F-5, MIDC Jejuri, Pune-412 303		
	GALVANISING	24	AT08	M/S AVAIDS TECHNOVATORS PVT. LTD	131, MATSYA INDUSTRIAL AREA, ALWAR RAJASTHAN		
ES31	GI WIRE & FLAT	1	I039	INDUSTRIAL PERFORATION (I) PVT.LTD.	MR. A. K. SAHA 327, R.N.GUHA ROAD, DUM DUM KOLKATA-West Bengal-India Phone- 9830241788 Pincode : 700028 Email : ipipl@cal2.vsnl.net.in	011 2737 3579	
	GI WIRE & FLAT	2	I070	INDIA ELECTRICALS SYNDICATE	Mr. Suresh Kumar Agarwal 55, Ezra Street, Kolkata-West Bengal-India Phone- 033-22354047 Pincode : 700001 Email : cabletray@vsnl.com	022-28511704	
	GI WIRE & FLAT	3	I072	INDMARK FORMTECH PVT. LTD.	Mr. Narendra R. Meher J Block, Plot No.-375, MIDC BHOSARI PUNE-MAHARASHTRA-INDIA Phone- 020-27130546 Pincode : 411026 Email : indmarkformtech@vsnl.net		
	GI WIRE & FLAT	4	P039	PREMIER POWER PRODUCTS (CAL) PVT. LTD.	Chatterjee International Centre, 33A, Jawaharlal Nehru Road, 6th Floor, Suit No. - 11A, Kolkata,- West Bengal-India Phone- 9331008739 Pincode : 700071 Email : hemantdaga@dagaventures.com		
	GI WIRE & FLAT	5	P050	PATNY SYSTEMS (P) LTD	PATNY PLAZA 160 , SARDAR PATEL ROAD SEUNDRABAD SECUNDRABAD-TELANGANA-INDIA Phone- 040-27902451 Pincode : 500003 Email : mr.mkt@patnysystems.com		
	GI WIRE & FLAT	6	P079	PASSIVE INFRA PROJECTS PVT. LTD.	MR. VARUN AGRAWAL 182, VAISHALI, PITAMPURA Delhi-DELHI-INDIA Phone- 9871183059 Pincode : 110088 Email : ATANU.SAHA@PASSIVEINFRA.COM		
	GI WIRE & FLAT	7	R036	RUKMANI ELECTRICAL & COMPONENTS PVT LTD	11A, MAHARISHI DEBENDRA ROAD 1ST FL , ROOM NO.4 KOLKATA-WEST BENGAL-INDIA Phone- Pincode : 700007 Email : maruthikabra@gmail.com		
	GI WIRE & FLAT	8	R037	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	MR. G.D. SINGHEE/MR. MAHESH SINGHEE 26, P.K. TAGORE STREET, MAIN BUILDING KOLKATA WEST BENGAL-INDIA Phone- 9830177331 Pincode : 700006 Email : mahesh@ratans.com		
	GI WIRE & FLAT	9	R041	RABI ENGINEERING WORKS PVT. LTD.	MR. TAPAN KUMAR SEN/MR. SIDDHARTHA 327, R.N. GUHA ROAD, DUM DUM, KOLKATA-WEST BENGAL-INDIA Phone- 9748753002 Pincode : 700028 Email : rabiengineering@gmail.com		
	GI WIRE & FLAT	10	R200	RAJASTHAN METAL SMELTING CO.	Mr. R. K. Tibrewala D-80, Road No. 7, V.K.I.A., Jaipur-Rajasthan-India Phone- 0141-2332269 Pincode : 302013 Email : info@rmscoindia.com		
	GI WIRE & FLAT	11	S210	SARAL INDUSTRIES	Mr. Y.K. Gupta L-1, L-2, Industrial Area-1 Sultanpur Road Rae Bareli-Uttar Pradesh-India Phone- 0535-2702474 Pincode : 229010 Email : saralindustries@gmail.com		
	GI WIRE & FLAT	12		PARCO Engineers Pvt. Ltd.	401, skyline Epitom Building ,Near to Jolly Gym Khana, Kirol Road , Vidhyavihar, MH 400086 India		
	GI WIRE & FLAT	13	U019	UNITECH FABRICATORS and ENGINEERS PVT LTD	INDRAPRASHTHA APARTMENT 24 , M.B.RAOD , BIRATI KALABAGAN KOLKATA KOLKATA-WEST BENGAL-INDIA Phone- Pincode : 700051 Email : ufepl@vsnl.net; ufepl@rediffmail.com	022 - 26230814	
ES32	HIGH MAST	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	SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID :rabans@bajajelectricals.com;	
	HIGH MAST	2	TL01	M/S TRANSRAIL LIGHTING LIMITED (TLL)	M/S TRANSRAIL LIGHTING LIMITED (TLL), GAMMON INDIA LIMITED 2ND FLOOR , CENTRIC PLAZA, PLOT NO.8 POCKET-4, SECTOR-11 DWARKA , NEW DELHI -110075	hemant.jain@transrailttd.com'	
ES33	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	
	IND.POWER & WLDG SOCKETS	2	E1207	CYCLO 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	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES33	IND. POWER & WLDG SOCKETS	3	B04	BCH	20/4, MATHURA ROAD, FARIDABAD - 121006, HARYANA, INDIA	0129-4063000, 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@ajmera.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, BIDD, 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-600032	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	
ES36	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, SURAJPUR 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-online.com	
	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
	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	

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	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	SB02	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	
	LIGHTING DISTRIBUTION BOARDS	1	E1007	ADVANCE ENGG. COMPANY	38,SETHI IND. ESTATE 10/E,SUREN RD,ANDHERI MUMBAI-400097	91 - 22 - 24360086	
	LIGHTING DISTRIBUTION BOARDS	2	STRG01	Sterling Generators Pvt. Ltd.	C-56/38, INSTITUTIONAL AREA, SECTOR-62, NOIDA -201307, U.P.	Nityanand Engineer-Sales & Marketing (Panel Division) Noida, UP 201307, India Mobile+91-8510022170	
	LIGHTING DISTRIBUTION BOARDS	3	E1091	MIKA ENGINEERS	BRANCH OFFICE : 'D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi E-mail : mika@mtlnet.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230 74373 ; Email: asgar@mikaengineers.com	
	LIGHTING DISTRIBUTION BOARDS	4	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LIGHTING DISTRIBUTION BOARDS	5	KM1	KMG ATOZ SYSTEMS	"ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA)	Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710	
	LIGHTING DISTRIBUTION BOARDS	6	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	LIGHTING DISTRIBUTION BOARDS	7	AVA01	AVAIODS TECHNOVATORS LTD.	PLOT NO.25 ,SECTOR-3,JMT-MANESAR, GURGEON-122050 (HARYANA)	KRISHNA KALRA- 09958096168	
	LIGHTING DISTRIBUTION BOARDS	8	ACE01	Adroit Control Engineers Pvt.Ltd.	M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL. AREA, SECTOR-25 FARIDABAD – 121004	011-47600700, 0129-4251400	
	LIGHTING DISTRIBUTION BOARDS	9	JC01	JACKSON ENGINEERS	A-43, HOSEIRY COMPLEX, OPPOSITE NSEZ, NOIDA-201305	0120-4302600, 2568923,27	
	LIGHTING DISTRIBUTION BOARDS	10	ADL01	Adlec Systems Private Limited	PLOT NO-277, SWARN PARK, UDYOG NAGAR, MUNDKA, MAIN ROHTAK ROAD, UDYOG NAGAR, NEW DELHI, DELHI 110041	011 2834 5061	
ES38	LIGHTING DISTRIBUTION BOARDS	11	POP01	Popular Switchgears Pvt Ltd	712, ARUN CHAMBERS, TARDEO MAIN ROAD, TARDEO, NEAR TARDEO AIRCONDITIONER MARKET, MUMBAI - 400034	-9362634406	
	LIGHTING DISTRIBUTION BOARDS	12	CS01	CANDS	J/202, ANSA INDUSTRIAL ESTATE, SAKI VIHAR ROAD, SAKINAKA, ANDHERI (EAST), MUMBAI-72	022-28570858	
	LIGHTING DISTRIBUTION BOARDS	13	PYRE01	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd.(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya (psisodia@pyrotechlighting.com) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309	

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	LIGHTING DISTRIBUTION BOARDS	14	PCS01	Positronics Pvt. Ltd.	POSITRONICS HOUSE, 882/ 2, G.I.D.C. MAKARPURA,VADODARA 390010 GUJARAT	+91 265 2642496 Fax: +91 265 264 7033 / 234 0944 E-mail : info@positronicsindia.com Website:www.positronicsindia.com	
	LIGHTING DISTRIBUTION BOARDS	15	ISC01	Industrial Switchgears & Control Pvt Ltd	S-02 AMARDEEP MAHAL, NANDA PATKAR RD, VILE PARLE EAST, MUMBAI - 400057	(91)-22-26182011	
	LIGHTING DISTRIBUTION BOARDS	16	VC01	M/s Vidhyut Control (I) Pvt.Ltd.	D-12 & 13, SECTOR-17, KAVI NAGAR INDL AREA, GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA		
	LIGHTING DISTRIBUTION BOARDS	17	MIL01	MILESTONE SWITCHGEARS PVT. LTD.	MILESTONE SWITCHGEARS PVT. LTD. 97, UDYOG VIHAR, PHASE-1, GURGEON HARYANA - 122016	Phone Nos.: 0124-4994900 (30 Lines) Fax: 0124-4002973 Email: jaideep.ahuja@milestonesindia.com URL: www.milestonesindia.com	
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	ELEXPLO 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	CO2	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	
	LIGHTING FIXTURES (NON LED)	6	E1051	EVERGREEN ENGG. CO.	EVERGREEN ENGG COMPANY WORKS-5, PLOT NO. 9,10,11,12, SURVEY NO. 242, CHINCH PADA, VASAI EAST-401208	(0250) 6458250	
	LIGHTING FIXTURES (NON LED)	7	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	01244606001, Sharad (+919871150447)	
	LIGHTING FIXTURES (NON LED)	8	WP01	WIPRO LTD.	WIPRO CONSUMER CARE AND LIGHTING, 5TH FLOOR, GODREJ ETERNIA -C, OLD PUNE-MUMBAI ROAD, SHIVAJINAGAR, PUNE -411005	020-66098700	
	LIGHTING FIXTURES (NON LED)	9	HP01	M/S HPL ELECTRIC & POWER PVT. LTD	M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIDC, INDL AREA, KUNDLI, DIST.- SONEPAT (HARYANA) - 131028	mohitsharma@hplindia.com'	
	LIGHTING FIXTURES (NON LED)	10	SR01	SURYA ROSHNI LIMITED	PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI	011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com	
	LIGHTING FIXTURES (NON LED)	11	HI02	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING FIXTURES (NON LED)	12	HN13	M/s Halonix Technologies Limited	M/s Halonix Technologies Limited B-31 , Phase -II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305	Mr. Mohit Gautam 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; 'rahul.singh@halonix.co.in'	
	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@neenergy.in, Jitendra Sahu <jsahu@neenergy.com>	
LIGHTING FIXTURES (LED)	(2	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922, girish.srivastava@havells.com\		
LIGHTING FIXTURES (LED)	(3	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;		
LIGHTING FIXTURES (LED)	(4	SR01	SURYA ROSHNI LIMITED		1 011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com		
LIGHTING FIXTURES (LED)	(5	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002	01244606001, Sharad (+919871150447), Mr. Guruseelan M 8939693949, Mr Ashish Sethi 9007077089		

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES40	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(phisodia@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: 8527652687	
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	WPO1	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	PO1	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.- SONEPAT (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'	

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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@neenergy.in	
	LIGHTING LAMP (LED)	2	HI01	HAVELLS INDIA LIMITED	GRG 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.-SONEPAT (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	
	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'	
ES44	LIGHTING POLES	1	E1033	BOMBAY TUBE & POLES CO	BOMBAY TUBES & POLES CO. 2ND LANE, DARUKHANA, PLOT NO. 100, MAZGAON, MUMBAI - 10	Tel. : +91 22 23729802, email ID: btpc1954@hotmail.com	
	LIGHTING POLES	2	E1118	RIDHDHI POLES	4/5 INDUSTRIAL ESTATE, GORWA, VADODRA- 390016	0265 - 2283768	
	LIGHTING POLES	3	MK01	MIKA ENGINEERS	BRANCH OFFICE : 'D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054. WORKS : AT POST AGHAI, SHED NO. 2, VILLAGE AGHAI JILLA, SHAHPUR, DIST. THANE 421 601 TEL : 02527-249066/70 CELL : 099230 74373	Director : Mr. Asgar Karimi Email: asgar@mikaengineers.com;mika@ mtnl.net.in Telfax : 022-26610081/82/83/84 Tel : 02527-249066/70 Cell : 099230 74373	
	LIGHTING POLES	4	K02	KL INDUSTRIES	B1 1001 LOK GAURAV, LBS MARG, VIKHROLI WEST, MUMBAI - 400083	(91)-9821013736 (91)-22-25774272	
	LIGHTING POLES	5	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 POLES	6	TL01	TLL	M/S TRANSRAIL LIGHTING LIMITED (TLL), GAMMON INDIA LIMITED 2ND FLOOR , CENTRIC PLAZA, PLOT NO.8 POCKET-4, SECTOR-11 DWARKA , NEW DELHI -110075	hemant.jain@transrailtd.com'	
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	
	LIGHTING TRANSFORMER	1	E1021	AUTOMATIC ELECTRIC LTD.	ADDRESS : 96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	

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ES46	LIGHTING TRANSFORMER	2	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
	LIGHTING TRANSFORMER	3	E1103	POWER PACK ENTERPRISES	POWER PACK ENTERPRISES MR. NEHAL SHAH / MR. SHARAD SHAH (PARTNER) NO. 3, JAYSHREE SADAN, 1ST FLOOR, OLD NAGARDAS ROAD, ANDHERI EAST MUMBAI - 400069, MAHARASHTRA, INDIA	Call Us:08447573761 Mobile: +(91)-9821787821 +(91)-9821035604	
	LIGHTING TRANSFORMER	4	E1155	VIJAY ELECTRICALS LTD.	6-3-648/1&2, OFF RAJ BHAVAN ROAD, SOMAJIGUDA, HYDERABAD - 500 082. ANDHRA PRADESH, INDIA.	Vijay Electricals Mr. Bharat Giri / Ajay Giri (CEO) B 79, Gali No. 60, Sanjay Colony, Sector- 23 Faridabad - 121005, Haryana, India Call Us: 09953353612 websales@vijaelectricals.com	
	LIGHTING TRANSFORMER	5	E1057	GILBERT & MAXWELL	WORKS PLOT G-28 , M.I.D.C., AMBAD NASHIK - 422010, MAHARASHTRA, INDIA	Mr. Sanjeev Kulkarni, (Marketing Manager) Cell: 9822586724 sanjeev@kulkarni@gilbert-maxwell.in Phone : + 91 - 253 - 238 25 51 Fax : + 91 - 253 - 238 25 52	
	LIGHTING TRANSFORMER	6	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	LIGHTING TRANSFORMER	7	AIE01	Ames Impex Electricals Pvt. Ltd	C-18/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330	Phone:079 2282 1648	
ES47	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	8	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	9	E1019	ASIATIC	A-58 NARAINA IND. AREA, PHASE-I , NEW DELHI 110028	011 - 25796330, 25796617	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	10	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011 - 25793021	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	11	E1051	EVERGREEN ENGG. CO.	EVERGREEN ENGG COMPANY WORKS-5, PLOT NO. 9,10,11,12, SURVEY NO. 242, CHINCH PADA, VASAI EAST-401208	(0250) 6458250	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	12	E1143	TECKNIC CONTROLS	703, MADHAVA, BANDRA, KURLA COMPLEX, BANDRA EAST, MUMBAI, MAHARASHTRA 400051	022-42532507/00 022-24451648	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	13	E1053	EX-PROTECTA LIGHTING EQUIPMENT	305-306, GIDC ESTATE, VITHAL UDYOGNAGAR - 388121 DIST. ANAND, GUJARAT 388121 INDIA	02692-237823	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	14	E1206	BALIGA ELECTRICALS	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	15	E1210	ENPRO ENGG.	NO.995P, DIAMOND PLAZA, 2ND FLOOR, 12TH MAIN ROAD, ANNA NAGAR, CHENNAI-40	044 - 42611526 / 42170338 / 26262716 enproengg@enproengineering.com	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	16	E1132	STERLING SWGR CONTROL PVT.LTD.	P.O. BOX NO. 17023, SORAB HOUSE, 2ND FLOOR, 555, S.B. MARG, DADAR, MUMBAI - 400028, MAHARASHTRA, INDIA	91-22-24222297/24222298/24224236	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	17	F04	ELEXPRO ELECTRICALS PVT/LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	18	E1153	VAISHNO(HOTLINE SWGR & CONTROL)	G-19, SECTOR - 11, NOIDA - 201301, UTTAR PRADESH, INDIA	8377805157 9818338922	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	19	J01	JASPER ENGINEERS PVT. LTD.	A-23, SECTOR - 8, NOIDA-201301	0120-4033520/533	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	20	KM1	KMG ATOZ SYSTEMS	C-49, SECTOR-81-NOIDA-201305	120-4207920, 08527897328	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	21	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	22	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	23	E1035	CANDS	J/202, ANSA INDUSTRIAL ESTATE, SAKI VIHAR ROAD, SAKINAKA, ANDHERI (EAST), MUMBAI-72	022-28570858	

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	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	24	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	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	25	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	26	E1143	TECKNIC CONTROLS	703, MADHAVA, BANDRA, KURLA COMPLEX, BANDRA EAST, MUMBAI, MAHARASHTRA 400051	022-42532507/00 022-24451648	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	27	E1148	UNITED ELECTRIC	97 UDYOG VIHAR PHASE-I, GURGAON 122015, HARYANA	124 4002970 72	
	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	28	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213		
ES48	LOCAL PUSH BUTTON STATION (FLAME PROOF)						
	LIGHTING PANEL (FLAME PROOF)	1	E1206	BALIGA ELECTRICALS	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
ES49	LIGHTING PANEL (FLAME PROOF)	2	SS01	SUDHIR SWITCHGEAR	305/6, APEEJAY HOUSE, 130, BOMBAY SAMACHAR MARG, MUMBAI - 400 023. INDIA	Telephone Nos. : 40460000 (100 lines) Fax Nos. : ++-91-22-22049381 Email : md@sudhirswitchgears.com ; works@sudhirswitchgears.com ; scud@vsnl.com	
	LIGHTING PANEL (NON FLAME PROOF)	1	E1091	MIKA ENGINEERS	D-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi E-mail : mika@mtnl.net.in Telfax : 022-26610081/82/83/84 Tel : 02527-249066/70 Cell : 099230	
	LIGHTING PANEL (NON FLAME PROOF)	2	F04	ELEXPLO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORA NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LIGHTING PANEL (NON FLAME PROOF)	3	VC01	Vidhyut Controls (India) Pvt. Ltd.	M/S VIDHYUT CONTROL (I) PVT.LTD. D-12 & 13, SECTOR-17, KAVI NAGAR INDL AREA, GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA	0120-4186400, 0120-4186423, 8527005590(DK GUPTA)	
	LIGHTING PANEL (NON FLAME PROOF)	4	KM1	KMG ATOZ SYSTEMS	"ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA)	Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710	
	LIGHTING PANEL (NON FLAME PROOF)	5	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	LIGHTING PANEL (NON FLAME PROOF)	6	AVA01	AVAIODS TECHNOVATORS LTD.	PLOT NO.25 ,SECTOR-3,IMT-MANESAR, GURGEON-122050 (HARYANA)	KRISHNA KALRA- 09958096168	
	LIGHTING PANEL (NON FLAME PROOF)	7	ACE01	Adroit Control Engineers Pvt.Ltd.	M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL AREA, SECTOR-25 FARIDABAD – 121004	011-47600700, 0129-4251400	
ES50	LIGHTING PANEL (NON FLAME PROOF)	8	JC01	JACKSON ENGINEERS	A-43, HOSEIRY COMPLEX, OPPOSITE NSEZ, NOIDA-201305	0120-4302600, 2568923,27	
	LIGHTING PANEL (NON FLAME PROOF)	9	MIL01	MILESTONE SWITCHGEARS PVT. LTD.	MILESTONE SWITCHGEARS PVT. LTD. 97, UDYOG VIHAR, PHASE-1, GURGEON HARYANA - 122016	Phone Nos.: 0124-4994900 (30 Lines) Fax: 0124-4002973 Email: jaideep.ahuja@milestonesindia.com URL: www.milestonesindia.com	
	LIGHTING PANEL (NON FLAME PROOF)	10	PCS01	Positronics Pvt. Ltd.	POSITRONICS HOUSE, 882/ 2, G.I.D.C. MAKARPURA,VADODARA 390010 GUJARAT	+91 265 2642496 Fax: +91 265 264 7033 / 234 0944 E- mail : info@positronicsindia.com Website:www.positronicsindia.com	
	LIGHTING PANEL (NON FLAME PROOF)	11	PYRE01	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd.(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya (psisodiya@pyrotechlighting.com) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309	
	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	
ES51	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	
	MCC (FIXED TYPE)	1	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	

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ESS2	MCC (FIXED TYPE)	2	A01	ASSOCIATED SWGR & PROJ.LTD.	C-10, UPSIDC, INDUSTRIAL AREA, SITE-IV, KASNA ROAD, GREATER NOIDA-201306	0120-4294618,19,20 Asplho@gmail.com	
	MCC (FIXED TYPE)	3	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
ESS3	LV MOTORS (NON FLAME PROOF)	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	LV MOTORS (NON FLAME PROOF)	2	E1027	BHARAT BIJLEE LTD.	BHARAT BIJLEE LIMITED, 1ST FLOOR, 7-B, RAJINDRA PARK, PUSA ROAD, NEW DELHI - 110 060.	Tel.: + 91 (11) 25816931-33, 35 & 36 DT: +91 25724318 Fax: + 91 (11) 25819640 M:+ 91	
	LV MOTORS (NON FLAME PROOF)	3	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	
	LV MOTORS (NON FLAME PROOF)	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	LV MOTORS (NON FLAME PROOF)	5	K01	KIRLOSKAR ELECTRIC CO LTD.	P.O. BOX 5555 , MALLESWARAM WEST ,BANGALORE 560055	Tel: +91-80-23374865 Fax: +91-80-23377706	
	LV MOTORS (NON FLAME PROOF)	6	L04	LAXMI HYDRAULICS PVT. LTD	129/130, INDUSTRIAL ESTATE PATIL NAGAR, HOTGI ROAD SOLAPUR-413003, MAHARASHTRA	0217- 2357001-005	APPROVED UPTO 200KW
	LV MOTORS (NON FLAME PROOF)	7	M01	MARATHON	MARATHON ELECTRIC INDIA PRIVATE LTD.SECTOR - 11, MODEL TOWN, FARIDABAD - 121006	Ph: +91-129-2286421, 2265340, 4006601 to 4006610	
	LV MOTORS (NON FLAME PROOF)	8	A35	NGEF	POCKET NO.10, FLAT NO. 37 & 38, EXPANDABLE DDA FLATS, NASIRPUR DWARKA, PHASE-I NEW	Ph: (011) 2539 7763	
	LV MOTORS (NON FLAME PROOF)	9	E1115	RAJINDRA ELECT INDUSTRIES	14 SHAH IND.ESTATE VEERA DESAI RD,ANDHERI(W) MUMBAI-400053	91-22-26730823, 26730789; 91)-(22)-26730154	
	LV MOTORS (NON FLAME PROOF)	10	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	
ESS4	LV MOTORS (FLAME PROOF)	1	E1115	RAJINDRA ELECT INDUSTRIES	14 SHAH IND.ESTATE VEERA DESAI RD,ANDHERI(W) MUMBAI-400053	91-22-26730823, 26730789; 91)-(22)-26730154	
ESS5	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	H101	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
ESS6	OIL TEMP INDICATOR	1	E1101	PERFECT CONTROLS	BLOCK NO. 7, NORTH ROAD,WEST C.I.T. NAGAR,CHENNAI - 600035, INDIA.	Phone: (91-44) 24341043, 24330387, 42867651 Fax: (91-44) 24345075	
	OIL TEMP INDICATOR	2	E1105	PRECIMEASURE	M/S. PRECIMEASURE CONTROLS PVT. LTD. 168/C, INDUSTRIAL SUBURB, PEENYA 3RD PHASE, BANGALORE - 560058. KARNATAKA, INDIA	Phone EPABX: +91-80-42602702. Fax: +91-80-41552205 E-mail: info@precimeasure.com	
ESS7	PROTECTION - RELAYS (PNEUMATIC)	1	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	
	PROTECTION - RELAYS (PNEUMATIC)	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	PROTECTION - RELAYS (PNEUMATIC)	3	A35	GE-MULTILINE, GE INDIA INDUSTRIAL PVT. LTD.	NO. 90- B, ELECTRONICS CITY, HOSUR ROAD, BENGALURU - 560016, KARNATAKA	(080) 41314617, 9945478935	
	PROTECTION - RELAYS (PNEUMATIC)	4	SC01	SCHWEITZER ENGG. LAB (SEL)	406, BHIKAJI CAMA BHAVAN, BHIKAJI CAMA PLACE, BHIKAJI CAMA PLACE, MOHAMMADPUR, RK PURAM, NEW DELHI, DL 110066	011 4152 7899	
	PROTECTION - RELAYS (PNEUMATIC)	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	PROTECTION - RELAYS (PNEUMATIC)	6	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	PROTECTION - RELAYS (PNEUMATIC)	7	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	PROTECTION - RELAYS (PNEUMATIC)	8	C01	AVK-SEG & CONTROLS(I) LTD	C-60,NOIDA PHASE-II	6918834-37	
ESS8	PROTECTION - RELAYS (NUMERICAL)	1	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	
	PROTECTION - RELAYS (NUMERICAL)	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	PROTECTION - RELAYS (NUMERICAL)	3	A35	GE-MULTILINE, GE INDIA INDUSTRIAL PVT. LTD.	NO. 90- B, ELECTRONICS CITY, HOSUR ROAD, BENGALURU - 560016, KARNATAKA	(080) 41314617, 9945478935	
	PROTECTION - RELAYS (NUMERICAL)	4	SC01	SCHWEITZER ENGG. LAB (SEL)	406, BHIKAJI CAMA BHAVAN, BHIKAJI CAMA PLACE, BHIKAJI CAMA PLACE, MOHAMMADPUR, RK PURAM, NEW DELHI, DL 110066	011 4152 7899	
	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	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES59	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@ajmerna.net	
ES60	RESISTOR FOR DC STARTERS	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	RESISTOR FOR DC STARTERS	2	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	RESISTOR FOR DC STARTERS	3	E1119	RSI	60,IND.DEV.COLONY, MEHRAULI ROAD, GURGAON-122001	91 - 124 - 2333442	
	RESISTOR FOR DC STARTERS	4	S04	SPEED-O-CONTROL	C-16, NAND JYOT INDUSTRIAL ESTATE, SAFED POOL, ANDHERI-KURLA ROAD, SAFED POOL, MAGAN NATHURAM RD, SHIVAJI NAGAR, SAKINAKA, MUMBAI, MAHARASHTRA 400072	022 2851 8514	
	RESISTOR FOR DC STARTERS	5	E1137	SUSHIL ENGG CORP.	D-7, GHATKOPAR INDUSTRIAL ESTATE, OFF LBS MARG, GHATKOPAR (WEST), AMRUT NAGAR RD, AMRUT NAGAR, GHATKOPAR WEST, MUMBAI, MAHARASHTRA 400086	022 2500 7976	
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	ELEXPLO 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@ajmerna.net	
	SWITCH BOX	5	S02	S.B. ELECTRICAL ENGINEERING CORPORATION	03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002	022- 22069831; 022-66637259	
ES62	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	
	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	
ES63	TIMERS - PNEUMATIC	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	TIMERS - PNEUMATIC	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	TIMERS - PNEUMATIC	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	TIMERS - PNEUMATIC	4	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
	TIMERS - PNEUMATIC	5	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	TIMERS - PNEUMATIC	6	E01	ELECTRONIC AUTOMATION PVT. LTD.	20, KHB INDUSTRIAL AREA YELAHANKA BANGLORE-560064	080 -28567561 / 080 -28567562 / 080 -42802345	
ES64	TIMERS - ELECTRONIC	1	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES65	TRANSDUCERS	1	E1021	AUTOMATIC ELECTRIC LTD.	ADDRESS : 96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	TRANSDUCERS	2	E1202	SOUTHERN TRANSDUCERS	INTERTECH B-83, FLATTED FACTORY COMPLEX, NEAR MODI MILLS, OKHLA, NEW DELHI-110020	Mr. Gurmohit Singh 011-41020365 / 9891402128	
ES66	WINDING TEMP INDICATOR	1	E1101	PERFECT CONTROLS	OFFICE ADDRESS: 7, NORTH ROAD, WEST C.I.T. NAGAR, CHENNAI - 600035, INDIA.	Phone: (91-44) 24341043, 24330387, 42867651; Fax: (91-44) 24345075	
	WINDING TEMP INDICATOR	2	E1105	PRECIMEASURE	M/S. PRECIMEASURE CONTROLS PVT. LTD. 168/C, INDUSTRIAL SUBURB, PEENYA 3RD PHASE, BANGALORE - 560058. KARNATAKA, INDIA	Phone EPABX: +91-80-42602702. Fax: +91-80-41552205 E-mail: info@precimeasure.com	
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@sudhirschwitchgears.com ; works@sudhirschwitchgears.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@ajmerna.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 'cycloelectric@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-18/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330	Phone:079 2282 1648	
ES72	ENERGY METER (ANALOG)	1	B07	BHEL (EDN)	MYSORE ROAD, BANGALORE-560026	080-26998500	
	ENERGY METER (ANALOG)	2	E1129	SIMCO ENGG. LTD	NO. 126, K ROAD, TIRUCHIRAPPALLI -620001, TAMIL NADU	Mr. Madaswamy Muthu +(91)-(431)-4046223 +(91)-(431)-4046210 +(91)-9786600915	
	ENERGY METER (ANALOG)	3	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA	marketing@rishabh.co.in 91-253 2202202/203 Fax: 91 253 2351064	

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	ENERGY METER (ANALOG)	4	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	ENERGY METER (ANALOG)	5	CON1	CONZERVE SYSTEMS PVT. LTD.(SCHNEIDER)	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, UGURGAON 122001 HARYANA, INDIA.	4268899, 9910695701	
ES73	ENERGY METER (DIGITAL)	1	CON1	CONZERVE SYSTEMS PVT. LTD.(SCHNEIDER)	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, UGURGAON 122001 HARYANA, INDIA.	4268899, 9910695701	
	ENERGY METER (DIGITAL)	2	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES74	AMMETER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	AMMETER	2	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA	marketing@rishabh.co.in 91-253 2202202/203 Fax: 91 253 2351064.	
	AMMETER	3	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES75	VOLTMETER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
		2	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA	marketing@rishabh.co.in 91-253 2202202/203 Fax: 91 253 2351064.	
	VOLTMETER	3	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES76	MPCB	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	MPCB	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI- 110015	011-41419554/59	
	MPCB	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	
	MPCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	MPCB	5	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	MPCB	6	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
ES77	MAGNETIC OIL GAUGE	1	E1134	SUKRUT UDYOG	9/1/A, ERANDAWANE, OPPOSITE MEHENDALE GARAGE, ERANDAWANE, GULAWANI MAHARAJ RD, SWAROOP SOCIETY, VAKIL NAGAR, ERANDAWANE, PUNE, MAHARASHTRA 411004	020 2544 1726	
ES78	MULTIFUNCTION METER	1	CON1	CONZERVE SYSTEMS PVT. LTD./ SCHNEIDER ELECTRIC INDIA PVT. LTD.	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, GURGAON 122001 HARYANA, INDIA.	4268899, 9910695701	TAKEN OVER BY SCHNEIDER
	MULTIFUNCTION METER	2	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES79	RCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
	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	
ES80	PVC WIRES				BIS APPROVED MAKE		

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
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		
ES85	HUME PIPE				REPUTED MAKE		
ES86	PHOTOELECTRIC SWITCH				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)	Lighting System designer only for FGD, R&M and Hydro projects
	LIGHTING DESIGNER	6	CL13	CITELUM INDIA PVT. LTD	Y-14A, GREEN PARK MAIN, NEW DELHI-110016	Mr. Satyabrata Meher M: 8155001095, (email: smeher@citelum.in)	Lighting System designer only for FGD, R&M and Hydro projects
	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	
ES90	VAF METER (DIGITAL)	1	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.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES91	LED BASED HIGH INTENSITY AVIATION WARNING LIGHTS	1	INS1	M/s INSTA POWER LIMITED	Correspondence Address: M/s Insta Power Limited, S-19, Panch Shila Park, New-Delhi-110017 Manufacturing Unit: M/s Insta Power Limited, Khasra No. 103M, Raipur Industrial Area, Raipur, Bhagwanpur, Roorkee, Uttrakhand 247661	Manu Thakur (electrical1@instapower.com) Deepak Gupta (deepak.gupta@instapower.com) Abhijit R Vaish (abhijit.ra@instapower.com) Satyajit R Vaish (satyajit@instapower.com)	

ANNEXURE-B
2 X 660MW UDANGUDI STPP STAGE-I
TENTATIVE DRAWING LIST

S. NO.	DRAWING NO.	DRAWING TITLE
1	PE-V0-435-558-E101	GA DRAWING OF JB TYPE- JB-F
2	PE-V0-435-558-E102	GA DRAWING OF JB TYPE- JB-FE
3	PE-V0-435-558-E103	MOUNTING ARRANGEMENT OF BULK HEAD FIXTURE
4	PE-V0-435-558-E104	TYPE TEST REPORTS FOR LIGHTING FIXTURE
5	PE-V0-435-558-E105	FIELD QUALITY PLAN OF LIGHTING FIXTURE
6	PE-V0-435-558-E106	MOUNTING ARRANGEMENT OF LIGHTING FIXTURE IN FALSE CEILING AREA
7	PE-V0-435-558-E107	MOUNTING ARRANGEMENT OF WELL GLASS FIXTURE
8	PE-V0-435-558-E108	MOUNTING ARRANGEMENT OF HIGH/ MEDIUM BAY FIXTURE
9	PE-V0-435-558-E109	MOUNTING ARRANGEMENT OF FLOOD LIGHT FIXTURE
10	PE-V0-435-558-E110	MOUNTING ARRANGEMENT OF SWITCH/ RECEPTACLE BOXES
11	PE-V0-435-558-E111	GA DRAWING OF FIXTURE TYPE (SF63 LED)
12	PE-V0-435-558-E112	GA DRAWING OF FIXTURE TYPE (SF66 LED)
13	PE-V0-435-558-E113	GA DRAWING OF FIXTURE TYPE (SB11 LED)
14	PE-V0-435-558-E114	GA DRAWING OF FIXTURE TYPE (SB02 LED)
15	PE-V0-435-558-E115	GA DRAWING OF FIXTURE TYPE (SB03 LED)
16	PE-V0-435-558-E116	GA DRAWING OF FIXTURE TYPE (SF64 LED)
17	PE-V0-435-558-E117	GA DRAWING OF FIXTURE TYPE (SS62 LED)
18	PE-V0-435-558-E118	GA DRAWING OF FIXTURE TYPE (SS63 LED)
19	PE-V0-435-558-E119	GA DRAWING OF FIXTURE TYPE (SW41 LED)
20	PE-V0-435-558-E120	GA DRAWING OF FIXTURE TYPE (SW42 LED)
21	PE-V0-435-558-E121	GA DRAWING OF FIXTURE TYPE (MW96)
22	PE-V0-435-558-E122	GA DRAWING OF FIXTURE TYPE (MW98)
23	PE-V0-435-558-E123	GA DRAWING OF FIXTURE TYPE (FC02 LED)
24	PE-V0-435-558-E124	GA DRAWING OF FIXTURE TYPE (FC06 LED)
25	PE-V0-435-558-E125	GA DRAWING OF FIXTURE TYPE (FC07 LED)
26	PE-V0-435-558-E126	GA DRAWING OF FIXTURE TYPE (FC26 LED)
27	PE-V0-435-558-E127	GA DRAWING OF FIXTURE TYPE (FC30 LED)
28	PE-V0-435-558-E128	GA DRAWING OF FIXTURE TYPE (FC32 LED)
29	PE-V0-435-558-E129	GA DRAWING OF FIXTURE TYPE (FC33 LED)
30	PE-V0-435-558-E130	GA DRAWING OF FIXTURE TYPE (FC34 LED)
31	PE-V0-435-558-E131	GA DRAWING OF FIXTURE TYPE (FC81 LED)
32	PE-V0-435-558-E132	GA DRAWING OF SWITCH BOARD-TYPE SWB1
33	PE-V0-435-558-E133	GA DRAWING OF SWITCH BOARD-TYPE SWB2
34	PE-V0-435-558-E134	GA DRAWING OF SWITCH BOARD-TYPE SWB3
35	PE-V0-435-558-E135	GA DRAWING OF SWITCH BOARD-TYPE SWB4
36	PE-V0-435-558-E136	GA DRAWING OF SWITCH BOARD-TYPE SWB5
37	PE-V0-435-558-E137	GA DRAWING OF RECEPTACLE RA
38	PE-V0-435-558-E138	GA OF FLAME PROOF RECEPTACLE TYPE RA
39	PE-V0-435-558-E139	GA DRAWING OF RECEPTACLE RB
40	PE-V0-435-558-E140	GA DRAWING OF RECEPTACLE RC
41	PE-V0-435-558-E141	GA DRAWING OF CEILING FAN 1200MM
42	PE-V0-435-558-E142	GA DRAWING OF PEDESTAL FAN
43	PE-V0-435-558-E143	GA DRAWING OF EMERGENCY LIGHTING UNIT
44	PE-V0-435-558-E144	GA DRAWING OF 24V AC SUPPLY MODULE-FIXED
45	PE-V0-435-558-E145	GA DRAWING OF 24V AC SUPPLY MODULE-PORTABLE
46	PE-V0-435-558-E146	GA DRAWING OF HAND LAMP
47	PE-V0-435-558-E147	GA DRAWING OF 5A,24V SWITCHED PLUG
48	PE-V0-435-558-E148	GA DRAWING OF EMERGENCY EXIT LAMP

ANNEXURE-B
2 X 660MW UDANGUDI STPP STAGE-I
TENTATIVE DRAWING LIST

S. NO.	DRAWING NO.	DRAWING TITLE
49	PE-V0-435-558-E149	GA DRAWING OF WHEEL MOUNTED LADDER
50	PE-V0-435-558-E150	GA DRAWING OF FREE STANDING LADDER
51	PE-V0-435-558-E151	GA DRAWING OF STEP LADDER
52	PE-V0-435-558-E153	GA DRAWING OF SEARCH LIGHT
53	PE-V0-435-558-E201	LDC MV SWITCHGEAR ROOM
54	PE-V0-435-558-E202	LDC LV SWITCHGEAR ROOM
55	PE-V0-435-558-E203	LDC MAIN SWITCHGEAR ROOM
56	PE-V0-435-558-E204	LDC TURBINE SWITCHGEAR ROOM
57	PE-V0-435-558-E205	LDC BOILER SWITCHGEAR ROOM
58	PE-V0-435-558-E206	LDC BELOW MV SWGR ROOM
59	PE-V0-435-558-E207	LDC BELOW LV SWGR ROOM
60	PE-V0-435-558-E208	LDC BELOW MAIN SWITCHGEAR ROOM
61	PE-V0-435-558-E209	LDC BELOW TURBINE SWITCHGEAR ROOM
62	PE-V0-435-558-E210	LDC BELOW BOILER SWITCHGEAR ROOM
63	PE-V0-435-558-E211	LDC BELOW DC BATTERY ROOM
64	PE-V0-435-558-E212	LDC 220V DC BATTERY ROOM
65	PE-V0-435-558-E213	LDC 220V DC BATTERY CHARGER ROOM
66	PE-V0-435-558-E214	LDC TG HALL OPERATING FLOOR
67	PE-V0-435-558-E215	LDC MAIN / COMMON CONTROL ROOM
68	PE-V0-435-558-E216	LDC SWAS ROOM
69	PE-V0-435-558-E217	LDC AHU ROOM
70	PE-V0-435-558-E218	LDC EER ROOM
71	PE-V0-435-558-E219	LDC TG HALL GROUND FLOOR
72	PE-V0-435-558-E220	LDC TG HALL MEZZANINE FLOOR
73	PE-V0-435-558-E221	LDC TG HALL OPRTAING FLOOR
74	PE-V0-435-558-E222	LDC DEARATOR FLOOR
75	PE-V0-435-558-E223	LDC ESP CONTROL ROOM
76	PE-V0-435-558-E224	LDC ESP PLATFORMS
77	PE-V0-435-558-E225	LDC BOILER ELO.0M & MILL AREA
78	PE-V0-435-558-E226	LDC ID & PA FAN AREA
79	PE-V0-435-558-E227	LDC BOILER PLATFORMS
80	PE-V0-435-558-E228	LDC TRANSFORMER YARD
81	PE-V0-435-558-E229	LDC ROADS
82	PE-V0-435-558-E230	LDC DG BUILDING
83	PE-V0-435-558-E231	LDC COMPRESSOR HOUSE
84	PE-V0-435-558-E232	LDC SERVICE BUILDING
85	PE-V0-435-558-E233	LDC ADMIN BUILDING
86	PE-V0-435-558-E234	LDC MAIN GATE & TIME OFFICE
87	PE-V0-435-558-E235	LDC FUEL OIL PUMP HOUSE
88	PE-V0-435-558-E236	LDC CT SWITCHGEAR ROOM
89	PE-V0-435-558-E237	LDC DM TANK & PUMP HOUSE
90	PE-V0-435-558-E238	LDC HYDROGEN PLANT BUILDING
91	PE-V0-435-558-E239	LDC CPU REGEN. BUILDING
92	PE-V0-435-558-E240	LDC FOAM PUMP HOUSE
93	PE-V0-435-558-E241	LDC WORKSHOP BILDING
94	PE-V0-435-558-E242	LDC FIRE WATER PUMP HOUSE
95	PE-V0-435-558-E243	LDC FIRE WATER BOOSTER PUMP HOUSE
96	PE-V0-435-558-E244	LDC DESALINATED WATER PUMP HOUSE

ANNEXURE-B
2 X 660MW UDANGUDI STPP STAGE-I
TENTATIVE DRAWING LIST

S. NO.	DRAWING NO.	DRAWING TITLE
97	PE-V0-435-558-E245	LDC VACUUM PUMP HOUSE
98	PE-V0-435-558-E246	LDC AUX. BOILER BUILDING
99	PE-V0-435-558-E247	LDC PERMANENT STORE
100	PE-V0-435-558-E248	LDC CANTEEN BUILDING 1
101	PE-V0-435-558-E249	LDC ELECTRO-CHLORINATION PLANT
102	PE-V0-435-558-E250	LDC AIR WASHER BUILDING
103	PE-V0-435-558-E251	LDC SECURITY OFFICE
104	PE-V0-435-558-E252	LDC FUEL OIL TRANSFER PUMP HOUSE
105	PE-V0-435-558-E253	LDC CLARIFIED WATER PUMP HOUSE
106	PE-V0-435-558-E254	LDC CONDENSATE TRANSFER PUMP HOUSE
107	PE-V0-435-558-E255	LDC FIRE STATION
108	PE-V0-435-558-E256	LDC HYDROGEN GEN. PLANT
109	PE-V0-435-558-E257	LDC CANTEEN BUILDING 2
110	PE-V0-435-558-E258	LDC CANTEEN BUILDING 3
111	PE-V0-435-558-E259	LDC SECURITY BUILDING
112	PE-V0-435-558-E260	LDC ETP BUILDING
113	PE-V0-435-558-E261	LDC CW TREATMENT BUILDING
114	PE-V0-435-558-E262	LDC CHLORINATION (SW INTAKE)
115	PE-V0-435-558-E263	LDC SW INTAKE PH
116	PE-V0-435-558-E264	LDC SW OUTFALL PH
117	PE-V0-435-558-E265	LDC AUX. BOILER
118	PE-V0-435-558-E266	LDC WATCH TOWER
119	PE-V0-435-558-E267	LDC DISPENSARY
120	PE-V0-435-558-E268	LDC POST OFFICE & BANK EXTENSION
121	PE-V0-435-558-E269	LDC BANK EXTN. COUNTER
122	PE-V0-435-558-E301	LLO MV SWITCHGEAR ROOM
123	PE-V0-435-558-E302	LLO LV SWITCHGEAR ROOM
124	PE-V0-435-558-E303	LLO MAIN SWITCHGEAR ROOM
125	PE-V0-435-558-E304	LLO TURBINE SWITCHGEAR ROOM
126	PE-V0-435-558-E305	LLO BOILER SWITCHGEAR ROOM
127	PE-V0-435-558-E306	LLO BELOW MV SWGR ROOM
128	PE-V0-435-558-E307	LLO BELOW LV SWGR ROOM
129	PE-V0-435-558-E308	LLO BELOW MAIN SWITCHGEAR ROOM
130	PE-V0-435-558-E309	LLO BELOW TURBINE SWITCHGEAR ROOM
131	PE-V0-435-558-E310	LLO BELOW BOILER SWITCHGEAR ROOM
132	PE-V0-435-558-E311	LLO BELOW DC BATTERY ROOM
133	PE-V0-435-558-E312	LLO 220V DC BATTERY ROOM
134	PE-V0-435-558-E313	LLO 220V DC BATTERY CHARGER ROOM
135	PE-V0-435-558-E314	LLO TG HALL OPERATING FLOOR
136	PE-V0-435-558-E315	LLO MAIN / COMMON CONTROL ROOM
137	PE-V0-435-558-E316	LLO SWAS ROOM
138	PE-V0-435-558-E317	LLO AHU ROOM
139	PE-V0-435-558-E318	LLO EER ROOM
140	PE-V0-435-558-E319	LLO TG HALL GROUND FLOOR
141	PE-V0-435-558-E320	LLO TG HALL MEZZANINE FLOOR
142	PE-V0-435-558-E321	LLO TG HALL OPRTAING FLOOR
143	PE-V0-435-558-E322	LLO DEARATOR FLOOR
144	PE-V0-435-558-E323	LLO ESP CONTROL ROOM

ANNEXURE-B
2 X 660MW UDANGUDI STPP STAGE-I
TENTATIVE DRAWING LIST

S. NO.	DRAWING NO.	DRAWING TITLE
145	PE-V0-435-558-E324	LLO ESP PLATFORMS
146	PE-V0-435-558-E325	LLO BOILER ELO.0M & MILL AREA
147	PE-V0-435-558-E326	LLO ID & PA FAN AREA
148	PE-V0-435-558-E327	LLO BOILER PLATFORMS
149	PE-V0-435-558-E328	LLO TRANSFORMER YARD
150	PE-V0-435-558-E329	LLO ROADS
151	PE-V0-435-558-E330	LLO DG BUILDING
152	PE-V0-435-558-E331	LLO COMPRESSOR HOUSE
153	PE-V0-435-558-E332	LLO SERVICE BUILDING
154	PE-V0-435-558-E333	LLO ADMIN BUILDING
155	PE-V0-435-558-E334	LLO MAIN GATE & TIME OFFICE
156	PE-V0-435-558-E335	LLO FUEL OIL PUMP HOUSE
157	PE-V0-435-558-E336	LLO CT SWITCHGEAR ROOM
158	PE-V0-435-558-E337	LLO DM TANK & PUMP HOUSE
159	PE-V0-435-558-E338	LLO HYDROGEN PLANT BUILDING
160	PE-V0-435-558-E339	LLO CPU REGEN. BUILDING
161	PE-V0-435-558-E340	LLO FOAM PUMP HOUSE
162	PE-V0-435-558-E341	LLO WORKSHOP BILDING
163	PE-V0-435-558-E342	LLO FIRE WATER PUMP HOUSE
164	PE-V0-435-558-E343	LLO FIRE WATER BOOSTER PUMP HOUSE
165	PE-V0-435-558-E344	LLO DESALINATED WATER PUMP HOUSE
166	PE-V0-435-558-E345	LLO VACUUM PUMP HOUSE
167	PE-V0-435-558-E346	LLO AUX. BOILER BUILDING
168	PE-V0-435-558-E347	LLO PERMANENT STORE
169	PE-V0-435-558-E348	LLO CANTEEN BUILDING 1
170	PE-V0-435-558-E349	LLO ELECTRO-CHLORINATION PLANT
171	PE-V0-435-558-E350	LLO AIR WASHER BUILDING
172	PE-V0-435-558-E351	LLO SECURITY OFFICE
173	PE-V0-435-558-E352	LLO FUEL OIL TRANSFER PUMP HOUSE
174	PE-V0-435-558-E353	LLO CLARIFIED WATER PUMP HOUSE
175	PE-V0-435-558-E354	LLO CONDENSATE TRANSFER PUMP HOUSE
176	PE-V0-435-558-E355	LLO FIRE STATION
177	PE-V0-435-558-E356	LLO HYDROGEN GEN. PLANT
178	PE-V0-435-558-E357	LLO CANTEEN BUILDING 2
179	PE-V0-435-558-E358	LLO CANTEEN BUILDING 3
180	PE-V0-435-558-E359	LLO SECURITY BUILDING
181	PE-V0-435-558-E360	LLO ETP BUILDING
182	PE-V0-435-558-E361	LLO CW TREATMENT BUILDING
183	PE-V0-435-558-E362	LLO CHLORINATION (SW INTAKE)
184	PE-V0-435-558-E363	LLO SW INTAKE PH
185	PE-V0-435-558-E364	LLO SW OUTFALL PH
186	PE-V0-435-558-E365	LLO AUX. BOILER
187	PE-V0-435-558-E366	LLO WATCH TOWER
188	PE-V0-435-558-E367	LLO DISPENSARY
189	PE-V0-435-558-E368	LLO POST OFFICE & BANK EXTENSION
190	PE-V0-435-558-E369	LLO BANK EXTN. COUNTER
191	PE-V0-435-558-E401	CLO MV SWITCHGEAR ROOM
192	PE-V0-435-558-E402	CLO LV SWITCHGEAR ROOM

ANNEXURE-B
2 X 660MW UDANGUDI STPP STAGE-I
TENTATIVE DRAWING LIST

S. NO.	DRAWING NO.	DRAWING TITLE
193	PE-V0-435-558-E403	CLO MAIN SWITCHGEAR ROOM
194	PE-V0-435-558-E404	CLO TURBINE SWITCHGEAR ROOM
195	PE-V0-435-558-E405	CLO BOILER SWITCHGEAR ROOM
196	PE-V0-435-558-E406	CLO BELOW MV SWGR ROOM
197	PE-V0-435-558-E407	CLO BELOW LV SWGR ROOM
198	PE-V0-435-558-E408	CLO BELOW MAIN SWITCHGEAR ROOM
199	PE-V0-435-558-E409	CLO BELOW TURBINE SWITCHGEAR ROOM
200	PE-V0-435-558-E410	CLO BELOW BOILER SWITCHGEAR ROOM
201	PE-V0-435-558-E411	CLO BELOW DC BATTERY ROOM
202	PE-V0-435-558-E412	CLO 220V DC BATTERY ROOM
203	PE-V0-435-558-E413	CLO 220V DC BATTERY CHARGER ROOM
204	PE-V0-435-558-E414	CLO TG HALL OPERATING FLOOR
205	PE-V0-435-558-E415	CLO MAIN / COMMON CONTROL ROOM
206	PE-V0-435-558-E416	CLO SWAS ROOM
207	PE-V0-435-558-E417	CLO AHU ROOM
208	PE-V0-435-558-E418	CLO EER ROOM
209	PE-V0-435-558-E419	CLO TG HALL GROUND FLOOR
210	PE-V0-435-558-E420	CLO TG HALL MEZZANINE FLOOR
211	PE-V0-435-558-E421	CLO TG HALL OPRTAING FLOOR
212	PE-V0-435-558-E422	CLO DEARATOR FLOOR
213	PE-V0-435-558-E423	CLO ESP CONTROL ROOM
214	PE-V0-435-558-E424	CLO ESP PLATFORMS
215	PE-V0-435-558-E425	CLO BOILER ELO.OM & MILL AREA
216	PE-V0-435-558-E426	CLO ID & PA FAN AREA
217	PE-V0-435-558-E427	CLO BOILER PLATFORMS
218	PE-V0-435-558-E428	CLO TRANSFORMER YARD
219	PE-V0-435-558-E429	CLO ROADS
220	PE-V0-435-558-E430	CLO DG BUILDING
221	PE-V0-435-558-E431	CLO COMPRESSOR HOUSE
222	PE-V0-435-558-E432	CLO SERVICE BUILDING
223	PE-V0-435-558-E433	CLO ADMIN BUILDING
224	PE-V0-435-558-E434	CLO MAIN GATE & TIME OFFICE
225	PE-V0-435-558-E435	CLO FUEL OIL PUMP HOUSE
226	PE-V0-435-558-E436	CLO CT SWITCHGEAR ROOM
227	PE-V0-435-558-E437	CLO DM TANK & PUMP HOUSE
228	PE-V0-435-558-E438	CLO HYDROGEN PLANT BUILDING
229	PE-V0-435-558-E439	CLO CPU REGEN. BUILDING
230	PE-V0-435-558-E440	CLO FOAM PUMP HOUSE
231	PE-V0-435-558-E441	CLO WORKSHOP BILDING
232	PE-V0-435-558-E442	CLO FIRE WATER PUMP HOUSE
233	PE-V0-435-558-E443	CLO FIRE WATER BOOSTER PUMP HOUSE
234	PE-V0-435-558-E444	CLO DESALINATED WATER PUMP HOUSE
235	PE-V0-435-558-E445	CLO VACUUM PUMP HOUSE
236	PE-V0-435-558-E446	CLO AUX. BOILER BUILDING
237	PE-V0-435-558-E447	CLO PERMANENT STORE
238	PE-V0-435-558-E448	CLO CANTEEN BUILDING 1
239	PE-V0-435-558-E449	CLO ELECTRO-CHLORINATION PLANT
240	PE-V0-435-558-E450	CLO AIR WASHER BUILDING


ANNEXURE-B
2 X 660MW UDANGUDI STPP STAGE-I
TENTATIVE DRAWING LIST

S. NO.	DRAWING NO.	DRAWING TITLE
241	PE-V0-435-558-E451	CLO SECURITY OFFICE
242	PE-V0-435-558-E452	CLO FUEL OIL TRANSFER PUMP HOUSE
243	PE-V0-435-558-E453	CLO CLARIFIED WATER PUMP HOUSE
244	PE-V0-435-558-E454	CLO CONDENSATE TRANSFER PUMP HOUSE
245	PE-V0-435-558-E455	CLO FIRE STATION
246	PE-V0-435-558-E456	CLO HYDROGEN GEN. PLANT
247	PE-V0-435-558-E457	CLO CANTEEN BUILDING 2
248	PE-V0-435-558-E458	CLO CANTEEN BUILDING 3
249	PE-V0-435-558-E459	CLO SECURITY BUILDING
250	PE-V0-435-558-E460	CLO ETP BUILDING
251	PE-V0-435-558-E461	CLO CW TREATMENT BUILDING
252	PE-V0-435-558-E462	CLO CHLORINATION (SW INTAKE)
253	PE-V0-435-558-E463	CLO SW INTAKE PH
254	PE-V0-435-558-E464	CLO SW OUTFALL PH
255	PE-V0-435-558-E465	CLO AUX. BOILER
256	PE-V0-435-558-E466	CLO WATCH TOWER
257	PE-V0-435-558-E467	CLO DISPENSARY
258	PE-V0-435-558-E468	CLO POST OFFICE & BANK EXTENSION
259	PE-V0-435-558-E469	CLO BANK EXTN. COUNTER
260	PE-V0-435-558-E901	MQP FOR LUMINARIES
261	PE-V0-435-558-E905	MQP FOR MISCELLANEOUS ITEMS

Note:

1. The above list of drawings and documents is indicative. Number of drawings may vary as per project requirements.
2. Document submission schedule shall be as per NIT.

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ANNEXURE – C

SCOPE MATRIX FOR BROAD ACTIVITIES				
Sl. No.	Activities	Contractor	Associate	Remark (if any)
1	System Design			
2	Supply: - (a) Fixtures & Lamps (b) Other Items (as required for System completion)			
3	Supervision of Erection & commissioning			
4	Design review & changes based on site feedback for establishing correctness of the system at site			

Notes: -

1. Bidder to indicate Division of work (DOW)/ scope matrix between contractor & associate by indicating "Yes"/ "No" against each activity in the appropriate column, same to be furnished duly signed & stamped along with technical offer.

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1.0 INTENT OF SPECIFICATION

- 1.1 The requirements given in specification for supply of equipment and system design engineering shall be fully complied with.
- 1.2 For the equipment of supply in vendor's scope, the "design" shall broadly cover the selection of components, materials, sizes etc. and complete responsibility of establishing the correctness of equipment design rests with the vendor.
- 1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship, and shall be capable of performing required function in a manner acceptable to Purchaser, who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgement is not in full accordance herewith.
- 1.4 Make of all equipment and components shall be to the approval of Purchaser. Bidder to comply to Sub-vendor list enclosed as Annexure to Section I, however same shall be subjected to end client approval without any commercial implication.

2.0 CODES & STANDARDS

- 2.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.
- 2.2 The material, construction, manufacture, inspection and testing shall conform to the latest revisions of standards as specified in Data Sheet-A.
- 2.3 In case of conflict between the applicable reference standard and this specification, stringent requirement shall govern.

3.0 LIGHTING SYSTEM DESCRIPTION (CONCEPTUAL VIEW)

- 3.1 All areas of plant (indoor and outdoor) shall be provided with suitable lighting arrangement to meet the functional requirements by use of various types of luminaires so as to achieve the desired quality and level of illumination.
- 3.2 Lighting system shall also cover the low voltage power services such as power receptacles and single phase feeders.
- 3.3 Lighting system shall be fed through various power sources such as AC Normal, AC Emergency and DC Emergency supply to achieve the desired reliability.
- 3.4 Power tapped from various sources shall be distributed through lighting distribution boards and lighting panels upto the various luminaires and power outlet sockets / feeders.



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4.0 SYSTEM DESIGN ENGINEERING

Engineering shall be done by the vendor only during the contract engineering stage as the same is covered in his scope. During tender stage, bidder shall make his quotation on the basis of BOQ furnished by the purchaser with the tender document.

4.1 ENGINEERING INPUTS : Complete engineering shall be done by the vendor on the basis of documents listed below. The engineering inputs shall be furnished by purchaser. However, furnishing of these inputs shall not absolve the vendor of responsibility to visit site and get acquainted with actual site conditions.

4.1.1 Indoor Areas

- a) Room dimensions (details as covered in various layout drawings)
- b) Lighting System Design Data (LSDD) covering typical values for various types of indoor areas, indicating :
 - i. Required average illumination level
 - ii. Reflection factors for walls, ceiling and floor
 - iii. Maintenance factor
 - iv. Type of luminaire
 - v. Mounting height of luminaire
 - vi. Height of working plane
- c) AC Emergency lighting requirements
- d) DC lighting requirements
- e) Requirement of sockets
- f) Requirement of exhaust fans and fan points

4.1.2 Outdoor Areas

- a) Area geometry (details as covered in various layout drawings)
- b) Lighting System Design Data (LSDD) covering typical values for various types of outdoor areas, indicating:
 - i. Average illumination level
 - ii. Type of luminaire
 - iii. Pole heights / mounting height
 - iv. AC Emergency lighting requirement



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- v. DC lighting requirements
- vi. Maintenance factor
- c) Requirement of sockets

4.1.3 Other inputs

- a) Plot plan, Main equipment plan and TG hall floor plans (to assess quantum of area lighting drawings)
- b) Suggestive location of LDBs
- c) Suggestive power distribution scheme (SLDs)
- d) Control schemes
- e) Single phase feeder details
- f) No. of sockets / criteria for computation of no. of sockets / location of sockets etc.
- g) LDB/WDB details
- h) LP details
- i) Poles & Masts details
- j) Conduit sizes
- k) Wire sizes
- l) Earthing material sizes

4.2 DESIGN CRITERIA:

4.2.1 General Requirements of Design

- a) Lighting system shall be provided to ensure adequate visual performance, safety and reliability and shall be free from excessive glare and flicker from discharge lamps. Particular attention shall be paid to ensure that level of illumination is satisfactory in all respects including viewing of all instruments, alarms, annunciators and indicating lamps.
- b) Complete system design shall be done on the basis of inputs provided by the purchaser and in line with the laid down criteria.
- c) Requirements of sockets shall be as per the criteria / number of sockets given by the purchaser during detailed engineering stage.



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- d) Complete power distribution system shall be designed keeping following criteria in view :
- Simplicity
 - Controlled voltage drop
 - Cost effectiveness

4.2.2 Sources of Power Supply

- a) The illumination of various indoor and outdoor areas in the main plant and off site areas shall comprise of one or more of the following systems:
- Normal AC Lighting System
 - Emergency AC Lighting System
 - DC Lighting System
- b) Arrangement and distribution of power shall depend upon the functional requirements of areas and therefore supply from all types of power sources shall not be made available to all areas. Lighting & LV power services in different areas shall be provided as per Annexure-B enclosed.
- c) 24V AC lighting for maintenance purposes (for hand lamps and/or hand operated tools) shall be supplied from 240/24V fixed/ portable lighting module.

4.2.3 Lighting philosophy

a) Normal AC Lighting System

Normal AC lighting system 415V, 3 phase, 4 wire, will be fed from lighting panels (LPs) which in turn will be fed from the lighting distribution boards (LDBs). Street lights/ flood lights shall be fed from Street Lighting Panel (SLP), Welding receptacles shall be fed from Welding DB/ MCC in offsite areas.

b) Emergency AC Lighting System

This system shall be provided for certain important areas in the main plant. The lighting fixtures connected to this system shall be normally "ON" along with the normal AC system. These will be fed from emergency lighting panels (ELPs) which in turn will be fed from 3-phase, 4-wire supply from the emergency lighting distribution boards (ELDB'S). These lights will go off for a few seconds in case of AC supply failure at Emergency Switchgear, but shall be automatically restored when Emergency Switchgear is energized by Diesel generator set.

c) DC Lighting System

At strategic locations in the main plant, a few lighting fixtures fed from 220V DC supply, shall be provided to enable safe movement of operating personnel and access to important control points during an emergency, when both the normal AC and Emergency Lighting system fail. These lighting fixtures will be fed from 220V DC LPs which in turn will be fed from DC LDBs.



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The supply to the DC lighting panels shall be automatically switched ON in case of loss of AC supply at station service switchgear as well as Emergency switchgear. The DC supply will be automatically switched OFF after about 3 minutes following the restoration of supply to normal AC or emergency AC lighting system.

In auxiliary /off site buildings, emergency DC lighting is to be provided through self contained DC emergency fixture at strategic locations. The fixtures shall be switched 'ON' automatically in case of failure of AC supply.

d) Street Lighting/ Flood Lighting

Street lights / flood lights will be fed from Street Lighting Panel (SLP). The number of street lights / flood lights shall be grouped in such a way that they will be fed from the nearest SLP available. Street lights shall have provision of automatic switching ON and OFF in any one of the following modes and as per the purchaser's scheme:

- i. Manual
- ii. Automatic through 00 - 24 hrs time switch
- iii. Automatic through combination of 00 - 24 hrs time switch and a remote sensing device for monitoring external illumination level. Each SLP shall be provided with a time switch and a remote light sensing device.

4.2.4 Number of Luminaires

- a) All calculations shall be done as per the input data covered under "Engineering Inputs".
- b) Total AC luminaires

Total number of AC luminaires for indoor and outdoor areas shall be calculated on the basis of point to point method by an established computer program. Optimisation criteria shall form part of street lighting calculations.

For AC emergency lighting, a specified percentage of total AC luminaires shall be considered as AC emergency luminaires. The percentage shall be informed during detail engineering.

4.2.5 Layout Considerations

a) General Layout Considerations

- i. Layout of equipment such as LDBs and LPs shall be on the basis of following criteria :
 - Ease of operation
 - Maintainability
 - Aesthetics
- ii. Luminaires shall be located to meet the functional requirements of the area. Aesthetics shall form part of layout considerations.
- iii. Due considerations shall be given to the mounting arrangement depending upon location and type of area.



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- iv. While preparing lighting system layout drawings for air conditioned control rooms/areas having false ceilings, the vendor shall be required to interface with the Air Conditioning / Ventilation Duct layout and false ceiling layout drawings to avoid fouling / interference.
- v. The poles shall be located 1.5m away from the road edge. The buried cable shall run in hume pipe / duct bank wherever it is crossing the roads.
- vi. 240V AC, 5/15A universal socket (at least two number) shall be provided in office, store, cabin etc. The receptacles shall be provided at interval of 20m or part thereof for hand tools etc. One no. 20A, 240V AC industrial type receptacle shall be provided at suitable location in all other area as required. The receptacles shall be controlled through switch/MCBs. In hazardous area, receptacles shall be flame proof.
- vii. Suitable nos. of 63A/125A, 3 phase, 415V industrial receptacle with switch shall be provided at specific points in power plant area for welding purposes. At least one 63A/125A receptacle shall be provided in each off-site building.
- viii. 1200mm/ 1400mm sweep ceiling fans with stepped electronic regulator shall be provided for office room, store rooms and social buildings which are not covered by air-conditioned and ventilation system.
- ix. All fans including pedestal fans shall comply to relevant IS.

b) Conduit System

- i. Unless indicated otherwise, conduits shall originate from respective lighting panels and shall continue upto the luminaires for all indoor areas.
- ii. Conduits shall run in straight runs, parallel to building columns, walls etc. as far as practicable.
- iii. Unnecessary bends and crossings shall be avoided.
- iv. In the corrosive environment, conduit installations shall be made with corrosion proof conduits. Such requirements shall be clearly indicated while preparing BOQ.
- v. Conduits in control room and other air-conditioned areas shall be surface mounted on the roof above false ceiling. However vertical drops of conduits shall be through column flanges or grooved to the wall, finally covered for better aesthetics.

c) Wiring

- i. Each circuit from LP shall be taken in a separate conduit.
- ii. Wiring of AC normal, AC emergency & DC emergency lighting system shall be carried out in separate conduits.



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- iii. Receptacle wiring shall be distinct from lighting conduits. No two phase circuits shall be run in the same conduit. However different circuits of same phase may be laid in the same conduit.
- iv. Maximum three nos. of receptacles shall be loop-in & loop-out in a circuit.
- v. Filling area of wires in conduit shall not exceed 40% of the conduit area.
- vi. Wiring shall be done with following conductor sizes:
 - Luminaires – 2.5 sq. mm
 - 5A plug & socket – 2.5 sq. mm
 - 5/15A and 20A plug & socket – 4 sq.mm
- vii. Wiring shall be designed for the uniformly distributed spread of luminaires on each phase i.e. R,Y,B. Distribution of luminaires on these phases shall be such so that there is generally uniform light intensity in the event of failure of one or two phases.
- viii. Luminaires located in offices, stores, laboratories, toilets etc. shall be individually or group controlled.

d) Cabling

- i. Cables shall be considered wherever it is not desirable to run the insulated wires due to long runs or for any other valid reason.
- ii. Cable Schedule shall be prepared for all cable connections.

4.3 ENGINEERING OUTPUTS:

Vendor shall prepare and submit following documents and drawings for purchaser's approval :

- a) Lighting calculations for indoor areas covering details such as room dimensions (length, width, height), illumination level, reflection factors (walls, ceiling, floor), maintenance factor, type of luminaire, mounting height of luminaire, room index, coefficient of utilisation, no. of luminaires (AC Normal & AC Emergency), lumen output of each luminaire, reference drawings and remarks.
- b) 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. Calculated values of average and minimum illumination level as obtained through computer package shall also be furnished. Dot density plots for lux level shall be furnished if available in the computer package.
- c) Single line diagrams of power distribution upto Lighting Panels. Separate drawing for complete lighting distribution shall also be prepared by vendor.



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- d) Loads on each phase of LP and LDB with consideration of diversity factor for sockets.
- e) 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, DC Normal and DC Emergency). Bill of Material shall also be covered which shall include unit wise requirements of luminaires and other items.
- f) 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.
- g) 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 etc.
- h) Wiring and load distribution details for outdoor areas.
- i) 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 etc.
- j) In case of revised inputs or site feedback, preparation and submission of revised engineering outputs shall also be in the scope of vendor.
- k) Calculation for selection of number and size of containers
- l) Packing procedures and drawings.

5.0 LUMINAIRES, ACCESSORIES AND LAMPS

5.1 GENERAL REQUIREMENTS OF LUMINAIRES

- a) All luminaires and accessories shall be designed for continuous operation and shall be suitable for the system design data given in Data Sheet A.
- b) Luminaires shall be complete with accessories mounted inside the luminaire assembly. Lamps shall be supplied separately as per BOQ.
- c) All luminaires and accessories shall be suitable for operation in the atmospheric conditions prevailing at site.
- d) Power factor for fluorescent lamp luminaires shall be 0.9 or more and that for HPMV/ HPSV luminaires shall be 0.85 or more. Power factor correction capacitors shall be provided for this purpose.



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- e) Luminaires shall be designed for minimum glare. No bright spots should appear from the lamp or from the reflectors.
- f) All accessories shall be wired upto a terminal block or a separate weather proof metallic terminal box suitable for 2.5 sq. mm. copper wire termination.
- g) All internal wiring shall be of PVC or silicon rubber insulation, capable of withstanding the maximum temperature to which it will be subjected under specified service conditions without deterioration.
- h) All luminaires and accessories including the breathing holes shall be vermin proof.
- i) Surface Treatment:
 - All surfaces after manufacture shall be thoroughly cleaned and degreased. Pre-treatment of surfaces shall be as per the applicable standard. Pretreated surfaces shall be free from rust, sharp edges, scales and burrs.
 - Finish of surfaces shall be non-porous, smooth and unfaded.
- j) All metal parts of the luminaires shall be bonded and connected to the earthing terminal. Earthing terminal shall be suitable for connecting 14 SWG GI wire.
- k) Flood lights shall be provided with base frame / base plate for mounting on structural steel members / wall.
- l) All weather proof luminaires shall have the control gear housed in a weather proof enclosure with necessary gaskets, mounting bracket, locking screws etc.

5.2 LUMINAIRE TYPES & OTHER ITEMS

5.2.1 General requirements depending upon type of luminaire are listed below. Specific requirements of each luminaire are indicated in "Luminaire Details" enclosed as Annexure-I.

a) Channel Mounted Luminaires (Fluorescent Luminaires)

- Channel mounted luminaires, except the special purpose luminaires, shall have CRCA sheet steel base plate / rail / channel / box / side panels / housing as per "Luminaire Details". Sheet shall be completely stove enameled unless mentioned vitreous enameled in "Luminaire Details". Colour of enamel shall be grey on all non-reflecting surfaces and white on reflecting surfaces.
- Twin fluorescent luminaires shall be wired in lead-lag circuit to minimise stroboscopic effect.
- Luminaires suitable for surface mounting shall also be suitable for pendant mounting. Knockouts of 20mm ET conduit fixation shall be provided for this purpose.



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b) Decorative Fluorescent Luminaires

- Decorative luminaires shall be provided with one of the following as per “Luminaire Details” :
 - i. Perspex acrylic diffuser.
 - ii. High purity, anodised aluminium, mirror optic reflectors with anodised aluminium matt finish transverse fins to control glare.
 - iii. Opal polystyrene louvers and sheet steel side panels.
 - iv. Vertical metallic louvers finished in stove enamelled white and with sheet steel side panels.
- End plates of decorative luminaires shall be of high impact polystyrene or sheet metal finished in black colour.
- Diffusers and louvers for the fluorescent lamps shall be made of high impact polystyrene sheet and shall have no yellowing property over a prolonged period of use.
- Recessed type decorative luminaires shall be suitable for mounting with gypsum boards / luxalon / plaster of Paris/aluminium frame false ceiling of standard size as per Data Sheet A and “Luminaire details”.

c) Industrial Fluorescent Luminaires (General Purpose)

- Additional reflectors, wherever provided, shall be easily removable type.

d) Industrial Fluorescent Luminaires (Special Purpose)

- Luminaires for chemical vapour (acidic / alkaline) laden environment shall be of cast aluminium controlgear box and end boxes. Controlgear housing shall have detachable, one piece neoprene gasket cover to make it weather proof. Design shall be suitable for chemically charged environment.
- Luminaires for corrosive and dust laden environment shall be made of tray type sheet steel housing and transparent acrylic visor supported by a galvanised sheet steel frame, fitted to the housing with gasket all around. Cable entry shall be from the side of luminaire. Luminaire shall be totally dust and vapour proof.
- Luminaires for highly corrosive environment shall have with sheet aluminium/ polycarbonate housing. controlgear housing, CRCA sheet steel controlgear tray with a stove enamelled white reflector. A clear acrylic cover of dish shape, secured to canopy by stainless steel toggle and neoprene gasket lining, shall be provided at the bottom.



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- Luminaires for drip proof environment such as street lighting fluorescent luminaire shall have sheet aluminium canopy, a detachable reflector-cum-controlgear housing, clear ribbed acrylic cover held in aluminium frame. Luminaire shall have the degree of protection IP:55 unless mentioned otherwise in Data Sheet A. Luminaire shall be suitable for side entry mounting with the pole bracket arm.

e) Bay Type Luminaires

- Luminaires shall be designed for following indoor applications:
 - i) High bay
 - ii) Medium bay
 - iii) Low bay
- Luminaires shall have top mounted, cast aluminium controlgear housing. Housing shall have cooling fins and canopy for easy access to the components. Canopy shall be hinged at one end and wing screw bolted at the other end.
- Controlgear shall be connected to the detachable lamp housing at the bottom such that heat dissipation is proper and distributed.
- Lamp housing-cum-reflector shall be made from spun aluminium, electrochemically brightened and anodised.
- Lamp housing for the dust laden environment shall be totally enclosed type. A clear toughened glass cover shall be attached to the lamp housing with an aluminium frame and neoprene gasket. Luminaire shall be provided with a safety chain for toughened glass.
- Mounting arrangement shall consist of MS brackets with an anti-vibration eye-bolt.
- Side mounted controlgear box shall be provided for low bay luminaires, if mentioned in "Luminaire Details".

f) Well Glass Luminaires

- Well glass luminaires shall be suitable for dust and vapour laden environment.
- Luminaires shall be provided with a die-cast aluminium canopy and heat resistant well glass, fitted with a ring type gasket.
- All well glass luminaires shall be provided with vitreous enamelled reflector.
- Zinc plated MS wire guard shall be provided for protection of well glass.



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- Separate side mounted and top connected control gear box shall be provided for use with HPMV & HPSV lamps.
- Integral control gear box, where applicable, shall be of die cast aluminium material with one piece neoprene gasket between the box and its cover to make it dust and vapour proof.
- Luminaires shall be conduit mounted type for incandescent lamps and surface mounting type for HPMV & HPSV lamps.

g) Flame Proof Well Glass Luminaires

- Housing material shall be cast aluminium alloy LM6. Housing outer surface shall be provided with cooling fins.
- Flame proof luminaires shall be provided with heavy toughened well glass cemented in a retaining ring.
- Zinc-coated / chrome-plated MS chain connected to the main body and glass retaining ring shall be provided.
- A detachable terminal box at the top shall be provided.
- Neoprene gaskets, where needed, shall be provided for weather proof construction and indoor and outdoor application.
- Two cable entries of 20mm ET conduit shall be provided with one flame proof plug.
- Luminaires shall be suitable for the hazardous areas as classified in Data Sheet A. Design of flame proof luminaire shall be supported by the type test report for flame proofness from a government or government approved independent laboratory.

h) Street Lighting Luminaires (Other than Fluorescent Luminaire)

- These luminaires shall be suitable for street lighting and general purpose outdoor area lighting.
- Luminaire housing shall be one piece cast aluminium alloy to accommodate lamp housing and controlgear for lamp wattage upto 150 watts. For lamp wattage above 150 watts, controlgear housing shall be of cast aluminium alloy whereas lamp housing shall be of deep drawn aluminium.
- Inside finish of the lamp housing shall be stove enamelled white. Optical control shall be provided with two high purity, electro brightened and anodised side reflectors.



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- Clear acrylic bowl fitted with a rubber gasket and easily removable type shall be secured to the lamp housing.
- Provision shall be made for adjustment of lamp location for proper focussing.
- Luminaires shall be suitable for mounting with pole bracket arm.

i) Flood Lighting Luminaires

- Flood light lamp housing and reflector shall be separate from controlgear box. Requirements of controlgear box are specified elsewhere.
- Lamp reflectors shall be of high purity spun aluminium attached to the cast aluminium lamp holder housing at the rear. Lamp holder housing shall be provided with cooling fins.
- Reflector shall be closed from the front by heat resistant toughened glass and synthetic "S" type weather proof gasket.
- Luminaire shall be provided with special lamp centering and focussing device ensuring good beam control.
- MS mounting bracket shall allow fixation of the flood light in any position in a horizontal plane and the flood light can be locked in at any set angle in the vertical plane. Cast iron base and / or two protector scales shall also be provided where specified in "Luminaire Details"
- Design shall permit replacement of lamp from the rear without disturbing the previously set aiming angles. Special guide pins shall also be provided for protecting the lamps from damage while replacing.

j) Halogen Flood Lighting Luminaire

- Luminaires shall be compact in design with aluminium alloy housing and three piece highly polished and anodised reflector assembly.
- Toughened glass panel in the front shall be provided with silicon gaskets.
- Lamp replacement from the front is also acceptable.

k) Post Top Lanterns

- Luminaire shall comprise of a spun aluminium canopy, opal acrylic diffuser and a cast aluminium spigot.
- Controlgear shall be integral type and shall be housed in the spigot.
- Luminaire shall be supplied without mounting pole.



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l) Bulk Head (Flame Proof)

- Bulk head luminaires shall be used for the locations where explosion or fire hazard exists.
- Luminaire shall be made of cast iron housing with integral terminal box.
- Front of the luminaire shall be covered with flat toughened glass cemented into a retaining ring.
- Lamp replacement shall be from the front.
- Controlgear box for HPMV lamps shall be integral to the housing.
- MS fixing straps shall be provided for mounting.
- Luminaire shall be stove enameled grey outside and white inside.
- Terminal box shall be provided with 20 mm ET conduit entry.
- Complete luminaire shall be suitable for the hazardous area as classified in Data Sheet A. Type test certificate for flame proofness test from government or government approved independent laboratory shall be submitted.

m) Bulk Head (Weather Proof)

- Luminaire shall be suitable for indoor / outdoor applications having weather proof features.
- The luminaire shall comprise of die cast aluminium alloy body of dish shape.
- Luminaire shall have a heat resistant prismatic cover held in a weather proof gasket.
- Luminaire shall be stove enamelled grey outside and white inside.
- Glass cover shall have a galvanised wire protection.
- Luminaire shall be provided with locking arrangement with Allen key to prevent pilferage.
- Luminaire shall be suitable for use with incandescent lamp upto 100W.
- Provision for 20 mm ET conduit entry shall be provided at the bottom.



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n) LED type Luminaires:

- LED Luminaires shall be used for the lighting if specified in BOQ as part of NIT.
- In false ceiling area LED luminaires shall be recessed mounting type & in non-false ceiling area the LED luminaires shall be surface mounting type.
- The individual lamp wattage for LED shall be upto 3 watt.
- The LED chip efficacy shall be min 120 Lm/W. The luminaire efficacy shall be not less than 70Lm/W.
- The LED used in the luminaires shall have colour rendering index (CRI) of Min 65. Colour designation of LED shall be "cool day light" (min 5700K) type.
- The LED luminaire shall have minimum life of 25,000 burning hours with 80% of lumen maintenance at the end of the life.
- The beam angle for LED chip shall be 120 degrees.
- 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.
- The connecting wires used inside the system, shall be low smoke halogen free, fire retardant PTFE cable.
- Fuse protection shall be provided in input side specifically for LED luminaires.
- Care shall be taken in the design that there is no water stagnation anywhere. The entire housing shall be dust and water proof protection as per IS 12063.
- Driver Circuit: 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 manufacturer. LED Drivers may have following control & protections:
 - Suitable precision current control of LED.
 - Open Circuit Protection



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- Short Circuit Protection
- Over Temperature Protection
- Overload Protection

o) Emergency Lighting Luminaires

- The luminaire shall be automatic having in-built battery.
- Battery shall have integral charging unit.
- Charger shall be suitable for operation as per system design data.
- The battery enclosure shall be suitably painted and ventilated for the performance with sealed lead acid battery, as applicable.

5.3 CONTROLGEAR BOX (NON-INTEGRAL TYPE)

- a) Boxes shall have weatherproof construction and shall be provided with one piece neoprene gasket.
- b) Boxes shall be provided with HRC fuse mounted on a removable tray. Boxes shall be provided with all necessary components having a neat layout arrangement such that it is possible to test, inspect or replace any component without difficulty.
- c) Boxes shall be suitable for mounting on structures, walls and columns.
- d) Suitable number of terminals shall be provided for looping-in and looping-out of cable connections and also connections to the luminaire(s).
- e) Cable / conduit knock-outs shall be for each loop-in and loop-out connection and also connection to the luminaire(s).

5.4 REFLECTORS

- a) Reflectors shall be made of sheet steel or aluminium as applicable.
- b) The aluminium reflectors shall be made of high purity aluminium sheet. Sheet will be polished, electrochemically brightened and anodised.
- c) Wherever reflectors are separate from housing, they shall be securely attached to the luminaire by means of easily accessible fastening devices such that they are readily removable from the housing for maintenance.



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5.5 LAMP HOLDERS

- a) Holders shall be resistant to wear and shall be smooth in operation.
- b) Contacts shall be of durable quality.
- c) Holders shall hold the lamp under condition of shock and vibration.
- d) Lamp holders for fluorescent lamp shall be spring loaded, bi-pin, rotor type with low contact resistance.
- e) Live parts of the holder shall not be exposed when the lamp is inserted or removed in case of fluorescent luminaires.
- f) Lamp holders for HPMV & HPSV lamps shall be of porcelain material.
- g) Holders shall be screw type for HPSV & HPMV lamps. Holders for incandescent lamps shall be screw type, unless mentioned otherwise in Data sheet A.
- h) Lamp holders for incandescent lamps shall be of brass or porcelain.

5.6 STARTER HOLDERS

- a) Starter holders shall be designed and manufactured as per the applicable standard.

5.7 BALLASTS

- a) Fluorescent fixtures shall have electronic ballasts. Ballasts shall be totally enclosed type.
- b) Ballasts shall be easily removable type.
- c) Core shall be made of low loss, electrical grading stampings.
- d) End connections shall be made available in a terminal block, rigidly fixed to the ballast enclosure.
- e) Ballasts shall be free from humming.
- f) Ballast shall be provided separately for each lamp in a multi-lamp luminaire.
- g) Tappings shall be provided to set the voltage within range for HPMV & HPSV luminaires.

5.8 STARTERS

- a) Starters shall be made of aluminium material. Plastic or any other material if used shall be subject to purchaser's approval.
- b) Starters shall have bi-metal electrodes.



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- c) Starter shall be replaceable without the use of any tool and without disturbing any accessory or lamp.
- d) Starters shall have high mechanical strength.
- e) Starters shall be provided with radio interference suppressing capacitors.
- f) Starters shall have brass contacts.

5.9 CAPACITORS

- a) Capacitors shall have constant value of capacitance, suitable for operation at supply voltage.
- b) Capacitors shall be hermetically sealed, preferably in a metal enclosure to prevent seepage of impregnant and ingress of moisture.

5.10 LAMPS

- a) Lamps shall be suitable for use in any position.
- b) Lamps shall be capable of withstanding small vibrations without breakage to filaments / electrodes and lead-in wire.

5.10.1 Type of Lamps

- a) Fluorescent Lamp
 - i. Anode rings shall be provided to prevent blackening of the ends.
 - ii. Lamp caps shall be two pin type at each end.
- b) Incandescent (GLS) Lamps
 - i. Incandescent lamps shall be "clear" type.
- c) Mercury Vapour Lamps
 - i. Lamp caps shall be screw type.
- d) Sodium Vapour Lamps
 - i. Lamps shall be ovoid shaped with diffusing powder coating.
 - ii. Lamps shall be provided with external igniters and rapid restart facility.
 - iii. Lamp caps shall be screw type.



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e) Halogen Lamps

- i. Lamps shall be double ended linear type.
- ii. Lamps shall be of immediate start type.
- iii. Design of lamps shall ensure high performance and high efficiency.

5.11 JUNCTION BOXES

a) Junction boxes with terminals shall be supplied for branching and terminating lighting wires/cables whenever required, as specified.

b) Construction Features

- i. The junction boxes shall be fabricated out of material & thickness as specified in Datasheet-A and shall be of rectangular shape. The cover shall be hinged or bolted with captive nuts and bolts and shall be provided with neoprene gasket lining all over.
- ii. The junction boxes shall be provided with suitable knock outs/ gland plates for conduit/ cable connection. The conduit connection shall be properly sealed. The junction boxes meant for cable connection shall be complete with removable gland plates, glands and cable lugs, as required. The junction boxes shall be provided with two earthing terminals suitable for GI earthing wires.
- iii. The junction boxes shall be weather proof type conforming to IP-55..
- iv. The boxes and cover shall be hot dip galvanised. Junction boxes for corrosive areas like DM Plant, water treatment plant etc. shall have additional epoxy/acrylic coating of thickness not less than 50microns on outer surface.
- v. The junction boxes shall be suitable for mounting on wall, columns, etc. The brackets, bolts, nuts, screws and any other erection accessories required for erection shall be included.

c) Terminals

- i. Multiway terminal blocks of approved type and make complete with galvanised screws, nuts, washers and marking strips shall be furnished for terminating the lighting wires.
- ii. All the terminals blocks shall be of 650V grade one piece construction with insulating barriers. These terminals shall be made of copper alloy and shall be stud type. Each terminal provided on junction box shall be suitable for terminating two numbers of aluminium conductors of the size as specified without any damage to the conductors or looseness.



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d) The junction boxes shall be of following types:

Type	Description
JB-F	Provided with four (4) way stud type terminals for terminating upto 2 nos. 10 mm ² stranded aluminium conductors on each terminal, suitable for outdoor installations.
JB-FE	Same as above but with an additional epoxy coating of 50 micron thickness.
JB-S	Provided with four (4) way stud type terminals, each terminal suitable for terminating upto two nos. of 3.5Cx50 mm ² stranded aluminium conductors & with one no.6A HRC fuse and link.

5.12 RECEPTACLES

- a) Receptacle unit shall consist of socket outlet with associated switch and plug. The socket outlet and switch shall be flush mounted on a box which shall be suitable for mounting on wall or steel structures.
- b) Receptacle boxes shall be fabricated from material with thickness mentioned in Data Sheet A.
- c) Steel boxes shall be hot dip galvanised/ painted as specified in Datasheet-A and as per the requirements of applicable standard corresponding to the sheet thickness.
- d) The boxes shall have conduit knock-outs and shall be suitable for cable entry of the size to be specified by purchaser during detailed engineering.
- e) The boxes shall be provided with neoprene rubber gaskets to make them moisture and dust proof.
- f) Suitable loop-in and loop-out terminals shall be provided inside the box. Terminals for incoming and outgoing shall be suitable for the size of conductor of cables.
- g) The receptacle units shall be of the following types:
 - I. Type RA: It shall have the following:
 - i. 20A, 240V, 1-phase, 2 pole, 3-pin (third pin scrapping earth) porcelain, metal clad socket with a metallic cover tied to it.
 - ii. Rotary, heavy duty 20A switch conforming to applicable standard.
 - iii. Shrouded, die-cast aluminium plug.
 - iv. It shall be combined interlocked weather proof industrial unit.



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v. Mechanical interlock shall be provided as follows :

- Switch can be put ON only when plug is fully engaged.
- Plug can be withdrawn only when switch is in OFF position.
- Cover can be opened only when switch is in OFF position.

vi. The arrangement should ensure that water does not enter the plug when socket is ON.

vii. Loop-in loop-out terminals shall be provided inside the box suitable for 10 mm² Al conductor.

II. Type RB: It shall have the following:

- i. Combination of 5A & 15A, 240V, 1-phase, 2 pole, 3-pin, third pin grounded socket with integral piano key type 15A 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.

III. Type RC: It shall have the following:

- i. 63A, 415V, 3-phase-neutral earth, metal clad socket with cover
- ii. Rotary, heavy duty 63A switch conforming to applicable standard.
- iii. Shrouded, die-cast aluminium plug
- iv. It shall be combined, interlocked weather proof industrial unit.
- v. Mechanical interlock shall be same as that are applicable for RA type receptacles
- vi. The receptacle boxes shall be suitable for entry and exit of 3.5CX70 mm² 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.

IV. Type RD: It shall have the following:

- i. 125A, 415V, 3-phase-neutral earth, metal clad socket with cover.
- ii. Rotary, heavy duty 125A switch conforming to applicable standard.
- iii. Shrouded, die-cast aluminium plug



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- iv. It shall be combined, interlocked weather proof industrial unit.
 - v. Mechanical interlock shall be same as that are applicable for RC type receptacles
 - vi. The receptacle boxes shall be suitable for entry and exit of 3.5CX95 mm² 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.
- V. Type RE: It shall have the following:
- i. 5A, 240V, 1-phase, 2 pole, 3-pin, third pin grounded socket with integral piano key type 5A 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.

5.13 CEILING FAN & REGULATORS

- a) The bidder shall supply the following ceiling fans complete with suspension rod, canopy and accessories and regulators:
 - i. 1200 mm sweep
 - ii. 1400 mm sweep
- b) The fan motor shall be totally enclosed. The motor winding shall be of copper wire provided with double or reinforced class-E insulation.
- c) The fan shall have three (3) well balanced blades. Precaution shall be taken in the manufacture of fan as well as regulators to ensure reasonable degree of silence at all speeds.
- d) The regulator shall be electronic type with stepped/smooth (stepless) control of approved make.

5.14 LIGHTING CONTROL SWITCH-BOXES

- a) The switch-boxes shall be of bent steel construction, fabricated of 1.6 mm thick MS steel with 6 mm thick decorative bakelite or 3 mm thick perspex sheet cover. The boxes shall be hot dip galvanised.
- b) The switch-boxes shall be suitable for surface mounting as well as flush mounting in brick walls. They shall be flush mounted in the walls in the office areas where false ceiling is provided.



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- c) Switch-boxes shall have conduit knock-out on two sides. Adequate provision shall be made for ventilation of these boxes. Conduit knock-out sizes shall be as per conduit layout drgs.
- d) Switches shall be of piano-key type having quick-make, quick-break mechanism, provided with position marking, suitable for mounting on insulating plate. The switches shall be suitable for 1-phase, 240V, 50 Hz supply. They shall conform to relevant standards. The switches shall be supplied loose and shall be fixed at site according to requirement.
- e) All components housed in the switch-boxes shall be wired to an outgoing junction box by 1.5 mm² Cu wire. The junction box shall have adequate nos. of terminals.
- f) The size of switch-boxes shall be adequately chosen to accommodate the no. of switches and fan regulator boxes specified below. Fan regulators shall be supplied separately.
- i. Type SWB1 - Switch board with 1 no. 5A switch, JB type SW1.
 - ii. Type SWB2 - 3 nos. 5A switches and 1 no. fan regulator, JB type SW2.
 - iii. Type SWB3 - 7 nos. 5A switches, 3 nos. fan regulator, JB type SW3.
 - iv. Type SWB4 - 4 nos. 5A switches, JB type SW2.
 - v. Type SWB5 - 8 nos. 5A switches, JB type SW3.

JB details for lighting control switch boxes are as below:

JB-SW1 Provided with four (4) way stud type terminals, each terminal suitable for terminating upto two nos. of 10 mm² stranded aluminium conductor.

JB-SW2 Similar to the JB-SW1 but provided with ten (10) way terminals.

JB-SW3 Similar to the JB-SW1 but provided with eighteen (18) way terminals.

5.15 CABLE GLANDS

- a) Whether specifically mentioned or not, cable glands of suitable sizes shall be supplied along with each equipment for power and control cables.
- b) Rubber components used in the gland shall be of neoprene.
- c) Name / trade name of manufacturer, type no. and applicable range of outer diameter of cable shall be engraved / indelibly printed on the cable gland.

5.16 CABLE LUGS

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



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

5.17 FLEXIBLE METALLIC CONDUITS AND FITTINGS

- a) Flexible metallic conduits shall generally conform to the requirements of IS:3480.
- b) Flexible conduits shall be made of strip steel, which shall be of cold rolled mild steel. The strip shall be of uniform width and thickness throughout.
- c) The strip for making flexible conduit shall be wound tightly and so overlapped in subsequent helicals that no openings are seen in normal position.
- d) The surface of the strip shall be thoroughly cleaned before application of protective coating. Pre-treatment, before galvanization, shall conform to IS:6005.
- e) The strip shall be electro-galvanized to a minimum thickness of 25 microns as per IS 3480.
- f) Flexible conduits shall be lead coated for application in high temperature zones if specifically mentioned in Data Sheet A.
- g) The conduit shall have uniform diameter throughout its length. The internal surface of all conduits shall be free from burrs and sharp edges and suitable for pulling insulated cables and wires without damage.

5.18 PVC CONDUITS

- a) PVC conduits shall generally conform to the requirements of IS: 9537(Part I & Part III).

6.0 SURFACE TREATMENT

- 6.1 All metal parts and the surfaces (exterior & interior) of equipment, unless stated otherwise in case of reflectors, shall be degreased by dipping in hot alkaline solution and rubbed with wire brush to remove oil & scale from them & then rinsed in water. Alternatively, they may be shot / sand blasted.
- 6.2 Parts shall be pickled by dipping in hydrochloric acid tank to remove the rust from the surfaces formed during storage of sheets & then rinsed to remove traces of the acid. The cleaning and pretreatment of all metal parts shall be as per applicable standard.
- 6.3 The surfaces to be painted shall then be prepared by phosphatizing to protect them from further rusting & to create a good bond with the paint. The pretreatment shall conform to the applicable standard.
- 6.4 All parts shall then be subjected to a coat of red oxide primer paint.
- 6.5 All inside and outside surfaces of panel shall be spray painted with synthetic enamel of the shade as per Data Sheet A.



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- 6.6 Electrostatic or powder painting shall be acceptable subject to purchaser's approval.
- 6.7 Wherever possible, finished parts shall be coated with peelable compound by spraying method to protect the finished product from scratches, grease, dirty and oily spots during handling and transportation.
- 7.0 PACKING**
- 7.1 Vendor shall furnish packing procedure along with packing drawing at contract stage for applicable items for purchaser approval.
- 7.2 Containers adequate for storing 70% 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.
- 7.3 Specification for the sea worthy packing, if enclosed, for the export jobs shall form part of the specification.
- 8.0 GUARANTEED PERFORMANCE REQUIREMENTS**
- 8.1 The vendor shall guarantee satisfactory performance of the equipment supplied under all conditions and requirement as laid down by this specification.
- 8.2 Vendor shall ensure satisfactory performance for lighting system designed by them at site.
- 9.0 INSPECTION & TESTING**
- 9.1 Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-558-E006) without any deviations. The equipment which are not covered in the Quality Plan shall be tested as per the QP to be submitted by bidder. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ ultimate customer's approval. There shall be no commercial implication to BHEL on account of any changes in QP during contract stage.
- 9.2 All the components and completely assembled equipment shall be tested as per the latest edition of standards. Charges for these tests shall be deemed to be included in equipment price.
- 9.3 All the specified type and routine tests shall be carried out to verify the rating and performance of the equipment. Where valid type test certificates in evidence of equipment performance claimed are available & approved by purchaser, the requirements for conducting type tests may be waived. The general arrangement of object under test shall be to purchaser's approval.
- 9.4 All manufacturing processes viz. machining, sheet forming, electroplating, wire routing, cleating & crimping, assembly, surface preparation shall conform to good manufacturing practices.



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

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

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

10.0 SPARES

- 10.1 Mandatory spares (if applicable) are indicated in BOQ-cum-price schedule.
- 10.2 Erection & commissioning spares are included in the bidder's scope of supply. BE&C spares are indicated in BOQ-cum-price schedule.
- 10.3 A list of recommended O&M spares quantities for a duration of 3 years A shall be filled up in the applicable schedule / format and submitted by bidder along with offer. However, the acceptance of the same shall not be binding on purchaser.

11.0 TOOLS AND TACKLE

- 11.1 Tools & tackle which are essential to facilitate assembly, adjustments, erection, maintenance & dismantling of equipment shall be provided as part of equipment supplied.
- 11.2 The above tools shall be supplied along with the initial consignment of equipment so as to be available prior to erection but may not be used for erection purposes.
- 11.3 Vendor shall also submit a list of recommended tools and tackle. Acceptance of these tools and tackle shall not be a binding on the purchaser.
- 11.4 Schedule of tools & tackle shall be filled up by bidder.

12.0 DOCUMENTATION

12.1 Documents to be submitted by the vendor immediately after award of contract

- a) Bar chart of activities of manufacture, testing, inspection and despatch.

12.2 Documents to be submitted during detailed engineering of contract

- 12.2.1 Engineering documents (refer clause 4.3) to be generated by the vendor, if applicable.



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- a) Lighting calculations for indoor areas.
- b) Lighting calculations for outdoor areas.
- c) SLD of power distribution upto LPs.
- d) Power load on each LP & LDB
- e) Layout drawings for indoor areas
- f) Layout drawings for outdoor areas.
- g) Conduit layout drawings.
- h) Wiring and load distribution details for outdoor areas.
- i) Master Bill of Material.
- j) Packing Procedure & drawing.
- k) Calculation for selection of no. & size of container.

12.2.2 Other documents :

- a) Final Quality Plans
- b) Technical data sheet
- c) Polar curves, zonal flux diagram and CoU charts of luminaires.
- d) Complete design calculations for arriving at number of luminaires.
- e) Fixing / mounting details of luminaires and other items.
- f) General arrangement drawings of following:
 - i. Luminaires
 - ii. Receptacles
 - iii. 24 V Supply module
- g) Field Quality Plan as per General Technical Conditions.
- h) Control Scheme for fluorescent, HPMV and HPSV luminaires.
- i) Schematic drawings for LDBs / LPs.
- j) Type test certificates.
- k) Catalogues / leaflets

12.3 Operation and Maintenance (O&M) manual :

The document shall comprise of installation, operating and maintenance instructions for various items / components. The O&M manual shall include the following :

- a) Write ups / instructions / procedures for
 - i. Storage at site.
 - ii. Unpacking.
 - iii. Handling at site.



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- iv. Erection.
- v. Pre-commissioning / commissioning tests.
- vi. Operating procedures.
- vii. Maintenance procedures.
- viii. Precautions to be taken during operation and maintenance work.
- ix. Trouble shooting charts covering problems, cause and solution.
- b) Approved Technical Data Sheets.
- c) Technical leaflet of various items / components.
- d) Copies of the type, acceptance and routine test certificates in bound volume.
- e) Details of all components liable to be replaced during the life of the equipment.
- f) List of maintenance tools required.
- g) List of testing equipment required.

12.4 AS BUILT DRAWINGS

- a) Preparation of as-built drawings shall be in the scope of vendor.
- b) The as-built drawings shall be prepared on the basis of marked up copies received from the erection contractor.
- c) Entire work of as-built drawings shall be to the satisfaction of purchaser.



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1.0 Fluorescent Lamp Luminaires

- | | | | |
|------|------|--------|---|
| 1.1 | FC01 | 1 x 28 | Fluorescent, industrial box type base without any cover. |
| 1.2 | FC02 | 2 x 28 | Fluorescent, industrial box type base without any cover. |
| 1.3 | FC03 | 1 x 28 | Fluorescent, industrial box type base and stove enamelled side reflectors. |
| 1.4 | FC04 | 2 x 28 | Fluorescent, industrial box type base and stove enamelled side reflectors. |
| 1.5 | FC05 | 1 x 28 | Fluorescent, industrial box type base and vitreous enamelled side reflectors. |
| 1.6 | FC06 | 2 x 28 | Fluorescent, industrial box type base and vitreous enamelled/ anodized glossy side reflectors. |
| 1.7 | FC07 | 1 x 18 | Fluorescent, industrial box type base and vitreous enamelled side reflectors operating on 220V DC input supply. |
| 1.8 | FC21 | 1 x 28 | Fluorescent, decorative with 3 side perspex acrylic diffuser. |
| 1.9 | FC22 | 2 x 28 | Fluorescent, decorative with 3 side perspex acrylic diffuser. |
| 1.10 | FC23 | 1 x 28 | Fluorescent, decorative, recessed type with perspex acrylic diffuser. |
| 1.11 | FC24 | 2 x 28 | Fluorescent, decorative, recessed type with perspex acrylic diffuser. |
| 1.12 | FC25 | 1 x 28 | Fluorescent, decorative, recessed type with mirror optic reflector. |
| 1.13 | FC26 | 2 x 28 | Fluorescent, decorative, recessed type with mirror optic reflector. |
| 1.14 | FC27 | 2 x 28 | Fluorescent, decorative with opal polystyrene louvers. |
| 1.15 | FC28 | 2 x 28 | Fluorescent, decorative, recessed type with opal polystyrene louvers. |
| 1.16 | FC29 | 2 x 28 | Fluorescent, decorative with vertical metallic louvers. |
| 1.17 | FC30 | 4 x 14 | Fluorescent, decorative, recessed type, 600 x 600 size with perspex acrylic diffuser. |
| 1.18 | FC31 | 4 x 20 | Fluorescent, decorative, recessed type, 600 x 600 size with opal polystyrene louvers. |



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- | | | | |
|------|------|--------|---|
| 1.19 | FC32 | 2 x 28 | Fluorescent, decorative, surface mounted with mirror optic reflector. |
| 1.20 | FC33 | 1 x 18 | Fluorescent, decorative, recessed type with mirror optic reflector operating on 220V DC input supply. |
| 1.21 | FC34 | 1 x 18 | Fluorescent, dust proof, totally enclosed type with sheet steel housing operating on 220V DC input supply |
| 1.22 | FC41 | 2 x 28 | Fluorescent, vapour proof with end boxes and controlgear box of cast Al. |
| 1.23 | FC51 | 2 x 28 | Fluorescent, dust proof, totally enclosed type with sheet steel housing. |
| 1.24 | FC61 | 1 x 28 | Fluorescent, street light with sheet aluminium canopy and ribbed acrylic cover. |
| 1.25 | FC62 | 2 x 28 | Fluorescent, street light with sheet aluminium canopy and ribbed acrylic cover. |
| 1.26 | FC81 | 2 x 28 | Fluorescent, corrosion proof, totally enclosed type with sheet aluminium/ polycarbonate housing. |

2.0 High Pressure Mercury Vapour (HPMV) Lamp Luminaire

- | | | | |
|------|------|----------|--|
| 2.1 | MB01 | 1 x 250 | Mercury, high bay, industrial type. |
| 2.2 | MB02 | 1 x 400 | Mercury, high bay, industrial type. |
| 2.3 | MB03 | 1 x 1000 | Mercury, high bay, industrial type. |
| 2.4 | MB04 | 1 x 250 | Mercury, high bay, totally enclosed industrial type. |
| 2.5 | MB05 | 1 x 400 | Mercury, high bay, totally enclosed industrial type. |
| 2.6 | MB06 | 1 x 250 | Mercury, high bay with non-integral controlgear box. |
| 2.7 | MB07 | 1 x 400 | Mercury, high bay with non-integral controlgear box. |
| 2.8 | MB11 | 1 x 250 | Mercury, medium bay, industrial type. |
| 2.9 | MB12 | 1 x 400 | Mercury, medium bay, industrial type. |
| 2.10 | MB13 | 1 x 250 | Mercury, medium bay, totally enclosed industrial type. |
| 2.11 | MB14 | 1 x 400 | Mercury, medium bay, totally enclosed industrial type. |



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- | | | | |
|------|------|---------|--|
| 2.12 | MB17 | 1 x 80 | Mercury, low bay, industrial type. |
| 2.13 | MB18 | 1 x 125 | Mercury, low bay, industrial type. |
| 2.14 | MB19 | 1 x 80 | Mercury, low bay, totally enclosed industrial type. |
| 2.15 | MB20 | 1 x 125 | Mercury, low bay, totally enclosed industrial type. |
| 2.16 | MW41 | 1 x 80 | Mercury, well glass, vapour proof with vitreous enamelled reflector. |
| 2.17 | MW42 | 1 x 125 | Mercury, well glass, vapour proof with vitreous enamelled reflector. |
| 2.18 | MW51 | 1 x 80 | Mercury, well glass, dust proof with vitreous enamelled reflector. |
| 2.19 | MW52 | 1 x 125 | Mercury, well glass, dust proof with vitreous enamelled reflector. |
| 2.20 | MW91 | 1 x 80 | Mercury, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing. |
| 2.21 | MW92 | 1 x 125 | Mercury, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing. |
| 2.22 | MW93 | 1 x 80 | Mercury, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing |
| 2.23 | MW94 | 1 x 125 | Mercury, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing. |
| 2.24 | MW95 | 1 x 80 | Mercury, well glass, flame proof increased safety luminaire with vitreous enamelled reflector and cast aluminium alloy LM6 housing for Div.-2 areas. |
| 2.25 | MW96 | 1 x 125 | Mercury, well glass, flame proof increased safety luminaire with vitreous enamelled reflector and cast aluminium alloy LM6 housing for Div. 2 areas. |
| 2.26 | MW98 | 1 x 125 | Mercury, well glass, flame proof increased safety luminaire with vitreous enamelled reflector and cast aluminium alloy LM6 housing |
| 2.27 | MS61 | 1 x 125 | Mercury, street light with one piece cast aluminium body. |
| 2.28 | MS62 | 1 x 250 | Mercury, street light with two piece cast aluminium body. |
| 2.29 | MS63 | 1 x 400 | Mercury, street light with two piece cast aluminium body. |



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2.30	MF61	1 x 250	Mercury, flood light, general purpose.
2.31	MF62	1 x 400	Mercury, flood light, heavy duty type.
2.32	MF63	2 x 400	Mercury, flood light, heavy duty type.
2.33	MP21	1 x 80	Mercury, post top lantern
2.34	MP22	1 x 125	Mercury, post top lantern
3.0	High Pressure Sodium Vapour (HPSV) Lamp Luminaire		
3.1	SB01	1 x 150	Sodium, high bay, industrial type.
3.2	SB02	1 x 250	Sodium, high bay, industrial type.
3.3	SB03	1 x 400	Sodium, high bay, industrial type.
3.4	SB04	1 x 150	Sodium, high bay, totally enclosed industrial type.
3.5	SB05	1 x 250	Sodium, high bay, totally enclosed industrial type.
3.6	SB06	1 x 400	Sodium, high bay, totally enclosed industrial type.
3.7	SB07	1 x 150	Sodium, high bay with non-integral controlgear box.
3.8	SB08	1 x 250	Sodium, high bay with non-integral controlgear box.
3.9	SB09	1 x 400	Sodium, high bay with non-integral controlgear box.
3.10	SB11	1 x 150	Sodium, medium bay, industrial type.
3.11	SB12	1 x 250	Sodium, medium bay, industrial type.
3.12	SB13	1 x 150	Sodium, medium bay, totally enclosed industrial type.
3.13	SB14	1 x 250	Sodium, medium bay, totally enclosed industrial type.
3.14	SB17	1 x 70	Sodium, low bay, industrial type.
3.15	SB18	1 x 150	Sodium, low bay, industrial type.
3.16	SB19	1 x 70	Sodium, low bay, totally enclosed industrial type.
3.17	SB20	1 x 150	Sodium, low bay, totally enclosed industrial type.
3.18	SW41	1 x 70	Sodium, well glass, vapour proof with vitreous enamelled/ powder coated type reflector.



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3.19	SW42	1 x 150	Sodium, well glass, vapour proof with vitreous enamelled/ powder coated type reflector.
3.20	SW51	1 x 70	Sodium, well glass, dust proof with vitreous enamelled reflector.
3.21	SW52	1 x 150	Sodium, well glass, dust proof with vitreous enamelled reflector.
3.22	SW91	1 x 70	Sodium, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing.
3.23	SW92	1 x 150	Sodium, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing.
3.24	SW93	1 x 70	Sodium, well glass, flame proof with vitreous enamelled reflector and cast aluminium alloy LM6 housing.
3.26	SW95	1 x 70	Sodium, well glass, flame proof increased safety luminaire with vitreous enamelled reflector and cast aluminium alloy LM6 housing for Div. 2 areas.
3.27	SW96	1 x 150	Sodium, well glass, flame proof increased safety luminaire with vitreous enamelled reflector and cast aluminium alloy LM6 housing for Div. 2 areas.
3.28	SS61	1 x 70	Sodium, street light with one piece cast aluminium body.
3.29	SS62	1 x 150	Sodium, street light with one piece cast aluminium body.
3.30	SS63	1 x 250	Sodium, street light with two piece cast aluminium body.
3.31	SS64	1 x 400	Sodium, street light with two piece cast aluminium body.
3.32	SF61	1 x 250	Sodium, flood light, general purpose.
3.33	SF62	1 x 400	Sodium, flood light, general purpose.
3.34	SF63	1 x 250	Sodium, flood light, heavy duty type.
3.35	SF64	1 x 400	Sodium, flood light, heavy duty type.
3.36	SF65	2 x 250	Sodium, flood light, heavy duty type.
3.37	SF66	2 x 400	Sodium, flood light, heavy duty type.
3.38	SP21	1 x 70	Sodium, post top lantern.



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4.0 Tungsten Lamp Luminaires

- | | | | |
|------|------|---------|--|
| 4.1 | TW41 | 1 x 100 | Tungsten, well glass, vapour proof with vitreous enamelled reflector. |
| 4.2 | TW42 | 1 x 200 | Tungsten, well glass, vapour proof with vitreous enamelled reflector. |
| 4.3 | TW51 | 1 x 100 | Tungsten, well glass, dust proof with vitreous enamelled reflector. |
| 4.4 | TW52 | 1 x 200 | Tungsten, well glass, dust proof with vitreous enamelled reflector. |
| 4.5 | TW91 | 1 x 100 | Tungsten, well glass, flame proof with vitreous enamelled reflector. |
| 4.6 | TW92 | 1 x 200 | Tungsten, well glass, flame proof with vitreous enamelled reflector. |
| 4.7 | TW95 | 1 x 100 | Tungsten, well glass, increased safety (Div. 2) with vitreous enamelled reflector. |
| 4.8 | TW96 | 1 x 200 | Tungsten, well glass, increased safety (Div. 2) with vitreous enamelled reflector. |
| 4.9 | TB21 | 1 x 60 | Tungsten, bulk head, weather proof. |
| 4.10 | TB22 | 1 x 100 | Tungsten, bulk head, weather proof. |
| 4.11 | TB91 | 1 x 100 | Tungsten, bulk head, flame proof. |
| 4.12 | TB92 | 1 x 200 | Tungsten, bulk head, flame proof. |
| 4.13 | TP21 | 1 x 200 | Tungsten, post top lantern. |
| 4.14 | TE02 | 1 x 20 | Tungsten, portable emergency unit with rechargeable battery. |
| 4.15 | TE02 | 1 x 40 | Tungsten, portable emergency unit with rechargeable battery. |
| 4.16 | TX01 | 1 x 60 | Tungsten, dispersive vitreous enamelled reflector. |
| 4.17 | TX02 | 1 x 100 | Tungsten, dispersive vitreous enamelled reflector. |
| 4.18 | TX03 | 1 x 75 | Decorative recessed mounting luminaire suitable for comptalux lamp. |
| 4.19 | TX04 | 1 x 100 | Decorative recessed mounting luminaire suitable for comptalux lamp. |

732157/2022/PS-PEM-EI



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4.20 TX05 2 x 100 Double obstruction aviation light of cast Al. alloy with red glass.


5.0 Halogen

5.1 HF61 1 x 300 Halogen, flood light, drip proof.

5.2 HF62 1 x 500 Halogen, flood light, drip proof.

5.3 HF63 1 x 750 Halogen, flood light, drip proof.

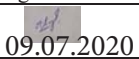

5.4 HF64 1 x 1000 Halogen, flood light, drip proof.

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		STANDARD QUALITY PLAN				SPEC. NO :		DATE:				
			CUSTOMER :				QP NO.:PE-QP-999-558-E001, R04		DATE: 23.06.2020				
			PROJECT:				PO NO.:		DATE:				
			ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 1 OF 10				
SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY	REMARKS	
1	2	3	4	5	6		7	8	9	*	**		
					M	C/ N				D	M	C	N

1.0 CONVENTIONAL TYPE LIGHTING FIXTURES

A	Bought out items / in-process checks													
1.1	Lamps	Make rating & type	Major	Visual	1 sample per type	-	Approved Data Sheet for rating & type , Make to be BIS approved with CML number	Approved Data Sheet for rating & type , Make to be BIS approved with CML number			P/ V *	-	-	Refer note No. 1
1.2	Electronic Ballast (if applicable)	Certificate of compliance	Major	Visual	Mnfr std.	-	Approved Data Sheet	Certificate of compliance by ballast manufacturer /lighting fixture that supplier that ballast meets all Approved Data Sheet requirements.	Certificate of compliance		P/ V *	-	-	Refer note No. 1
		THD and pf check	Major	Electrical	Mnfr std.	-	Approved Data Sheet	THD<=10% , pf>=0.9 for FH type and pf>=0.95 for other type of florescent lighting fixtures	Inspection report		P/ V *	-	-	Refer note No. 1

BHEL

ENGINEERING			QUALITY		
Sign & Date	Name	Checked by:	Sign & Date	Name	Reviewed by:
 09.07.2020	MEET SAGAR SINGH RAJPAL	by:	 09.07.20	KUNAL GANDHI	Digitally signed by PRAVEEN DUTTA Date: 2020.07.10 20:27:48 +05'30'

BIDDER/ SUPPLIER

Sign & Date	Seal


FOR CUSTOMER REVIEW & APPROVAL

Doc No:	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

Praveen

Digitally signed by Praveen Dutta
DN: cn=Praveen Dutta, o=BHEL,
ou=PS-PEM, Noida,
email=praveendutta@bhel.in, c=IN
Date: 2020.07.10 21:28:13 +05'30'

Dutta

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		STANDARD QUALITY PLAN				SPEC. NO :		DATE:	
			CUSTOMER :				QP NO.:PE-QP-999-558-E001, R04		DATE: 23.06.2020	
			PROJECT:				PO NO.:		DATE:	
			ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 2 OF 10	

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N					D	M	C	

1.3	Castings	Freedom from defects	Major	Visual	Mnfr std.	-	Approved Data Sheet	Casting shall be free from any defects such as blow holes , surface blisters , cracks and cavities etc.	Inspection report		P/V*	-	-	Refer note No. 1
1.4	Sheet metal forming and fabrication	Freedom from defects	Major	Visual	Mnfr std.	-	Approved Data Sheet	Sheet metal fabrication / forming etc should be as per manufacturer drgs.	Inspection report		P/V*	-	-	Refer note No. 1
1.5	Pre-treatment and powder coating	Pre-treatment process checks, Powder Coating finish, thickness , uniformity of coating and adhesion	Major	Visual, chemical & mech	Mnfr std.	-	Mnfr standard , Approved Data Sheet	Nominal coating thickness 50 microns or more	Inspection report		P/V*	-	-	Refer note No. 1


B. ACCEPTANCE TEST

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal		Sign & Date	Name	Seal	
MEET SAGAR SINGH RAJPAL	09.07.2020			09.07.20	KUNAL GANDHI						
PRAVEEN DUTTA			Digitally signed by RITESH KUMAR JAISWAL								

Praveen
Dutta

Digitally signed by Praveen Dutta
DN: cn=Praveen Dutta, o=BHEL,
ou=PS-PEM, Noida,
email=praveendutta@bhel.in,
c=IN
Date: 2020.07.10 21:28:44 +05'30'

Date: 2020.07.10 20:28:22 +05'30'

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		STANDARD QUALITY PLAN				SPEC. NO :		DATE:	
			CUSTOMER :				QP NO.:PE-QP-999-558-E001, R04		DATE: 23.06.2020	
			PROJECT:				PO NO.:		DATE:	
			ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 3 OF 10	

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/ N				*	D	**		

CONVENTIONAL TYPE LIGHTING FIXTURES	a) VISUAL	MA	VISUAL	IS 10322 (PART5 SEC1)	IS 10322 (PART 5 SEC1)	IS 10322 / APPD GA	IS 10322 / APPD GA	Inspection report	√	P	W	W		
	b) IR (Dry)	CR	Electrical	IS 10322	IS 10322	IS 10322	IS 10322	Inspection report	√	P	W	W		
	c) HIGH VOLTAGE	CR	Electrical	IS 10322	IS 10322	IS 10322	IS 10322	Inspection report	√	P	W	W		
	d) DUST PROOF	CR	Electrical	IS 10322	IS 10322	IS 10322	IS 10322	Inspection report	√	P	W	W		
	e) PHOTOMETRIC	CR	Electrical	IS-10322	*	IS 10322	IS 10322	Inspection report	√	P	W	W	*: One no.Luminaire of each type to be witnessed by BHEL/ Customer	
	2. ROUTINE TEST													
	a) VISUAL	MA	Visual	IS 10322 (PART5 SEC1)	IS 10322 (PART 5 SEC1)	IS 10322 / APPD GA	IS 10322 / APPD GA	Test cert	√	P	V	-		
	b) IR (Dry)	CR	Electrical	IS 10322	IS 10322	IS 10322	IS 10322	Test cert	√	P	V	-		
	c) HIGH VOLTAGE	CR	Electrical	IS 10322	IS 10322	IS 10322	IS 10322	Test cert	√	P	V	-		


KUNAL

09.07.20 GANDHI

BHEL			BIDDER/ SUPPLIER			FOR CUSTOMER REVIEW & APPROVAL		
ENGINEERING		QUALITY	Sign & Date		Seal	Doc No:		
Sign & Date	Name	Sign & Date	Name			Sign & Date	Name	Seal
Prepared by: 09.07.2020	MEET SAGAR SINGH RAJPAL	Checked by: 09.07.20	KUNAL GANDHI			Reviewed by:		
Reviewed by: Praveen Dutta	PRAVEEN DUTTA	Reviewed by: Digitally signed by JAISWAL	RITESH KUMAR			Approved by:		

Date: 2020.07.10 20:28:57 +05'30'

Praveen Dutta
Digitally signed by Praveen Dutta
DN: cn=Praveen Dutta, o=BHEL,
ou=PS-PEM, Noida,
email=praveendutta@bhel.in,
c=IN
Date: 2020.07.10 21:29:20 +05'30'

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		STANDARD QUALITY PLAN					SPEC. NO :			DATE:	
	CUSTOMER :		PROJECT:					QP NO.:PE-QP-999-558-E001, R04			DATE: 23.06.2020	
	ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM			SECTION: II			SHEET 4 OF 10			
	SL NO.	COMPONENT & OPERATIONS	CHARACTERIST ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTAN CE NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
1	2	3	4	5	6	7	8	9	* D	** M C N		
					M C/ N							

2.0 LED TYPE LIGHTING FIXTURES

A	Bought out items / in-process checks													
1.1	LED chip	LED chip efficacy	Major	Visual	Mnfr. Std.	-	LM 80 report	Appd Data Sheet	LM 80 report	√	P/V	V	V	At the time of final Inspection
		LED chip CRI & CCT	Major	Visual	Mnfr. Std.	-	LM 80 report	Appd Data Sheet	LM 80 report	√	P/V	V	V	At the time of final Inspection
		Reported TM21 (L80) lifetime of LED chip	Major	Visual	Mnfr. Std.	-	LM 80 report	Appd Data Sheet	LM 80 report	√	P/V	V	V	At the time of final Inspection
1.2	LED Driver	Compatibility with LED module / chip, controls & protection features	Major	Visual	Mnfr. Std.	-	Appd Data Sheet	Appd Data Sheet	Certificate of Compliance	√	P/V	V	V	Certificate of Compliance by LED driver manufacturer / lighting fixture supplier that driver meets all specifications requirement
		THD & pf check	Major	Electrical	Mnfr. Std.	-	Appd Data Sheet	THD <10% and pf >=0.9	Inspection report	√	P/V*	-	-	Refer note No. 1

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Prepared by:	09.07.2020	MEET SAGAR SINGH RAJPAL	Checked by:	09.07.20	KUNAL GANDHI						
Reviewed by:		PRAVEEN DUTTA	Reviewed by:	Digitally signed by KUMAR JAISWA	by RITESH						

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SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS								
					1	2			3	4	5	6			7	8	9	*	**			
												M	C/ N						D	M	C	N
1.3	Castings	Freedom from defects	Major	Visual	Mnfr. Std.	-	Mnfr. Std.	Casting shall be free from any defects such as blow holes , surface blisters , cracks and cravities etc.	Inspection report		P/V *	-	-	Refer note No. 1								
1.4	Sheet metal forming and fabrication	Freedom from defects	Major	Visual	Mnfr. Std.	-	Mnfr. Std.	Mnfr. Std.	Inspection report		P/V *	-	-	Refer note No. 1								
1.5	Pre-treatment and powder coating	Pre-treatment process checks, Powder Coating finish, thickness , uniformity of coating and adhesion	Major	Visual, chemical & mech	Mnfr. Std.	-	Mnfr. Std.	Nominal coating thickness 50 microns or more	Inspection report	√	P/V *	V	V	Refer note No. 1								

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MEET SAGAR SINGH RAJPAL	09.07.2020		KUNAL GANDHI	09.07.20							
PRAVEEN DUTTA			RITESH KUMAR JAISWAL								

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		CUSTOMER :				QP NO.:PE-QP-999-558-E001, R04		DATE: 23.06.2020	
		PROJECT:				PO NO.:		DATE:	
		ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 6 OF 10	

SL NO.	COMPONENT & OPERATIONS	CHARACTERIST ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTAN CE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N				D	M	C	N	


B Acceptance Tests on LED Lighting fixtures														
1	LED Lighting fixture	Details of lot offered and Certificate of Compliance that lighting fixture supplier has inspected the offered lot as per their own standard.	Major	Visual	-	-	Lighting fixtures supplier to submit the details of lot offered for inspection (Type of lighting fixtures, their batch number, sub-vendor , name, quantity)	-	List	√	P	V	V	The list may be used for sample selection.
2		LED chip make	Major	Visual	-	-	Accepted type test reports (LM80/LM79) report	Certificate of compliance	Certificate of compliance	√	V	V	V	
3		Constructional features including: Internal writing , terminal block, earthing terminal, safety chain (if applicable)	Major	Visual	1 Sample per type	1 Sample per type	Approved data sheet/drg.	Approved data sheet/drg.	Inspection report	√	P	W	W	
4		Resistance to moisture test in	Major	Mechanical	1 Sample	1 Sample	IS 10322 / Approved data	Approved data sheet	Inspection report	√	P	W	W	

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MEET SAGAR SINGH RAJPAL	09.07.2020		KUNAL GANDHI	09.07.20							
PRAVEEN DUTTA			Digitally signed by RITESH KUMAR JAISWAL								
Reviewed by:			Digitally signed by PRAVEEN DUTTA								
Approved by:											

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		PROJECT:				PO NO.:		DATE:	
		ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 7 OF 10	


SL NO.	COMPONENT & OPERATIONS	CHARACTERIST ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTAN CE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/ N			9	* D	M	C	N	
1	2	3	4	5	6	7	8	9	*	**				
		case of lighting fixtures having IP X4 and above rating.			e per type	e per type	sheet/drg							
5		Resistance to dust (applicable if IP5X and above)	Major	Optical	Mnfr. Std.	-	IS 10322 / Approved data sheet/drg.	Approved data sheet/drg	Certificate of compliance	√	P/ V *	V	V	Refer note No. 1
6		Photometry check	Major	Optical	Mnfr. Std.	-	LM79, IS 16106, IS 16107	Certificate of compliance for the batch: that offered lighting fixture LOR and lighting fixtures efficacy is not be less than 90% (refer IS 16107) with reference to type test reports.	Certificate of compliance	√	P/ V *	V	V	Refer note No. 1
7		Dimensions	Major	Visual	1 Sample per type	1 Sample per type	Approved data sheet/drg.	Approved data sheet/drg.	Inspection report	√	P	W	W	
8		LED driver: THD and pf check	Major	Visual	1 Sampl	1 Sampl	Approved data sheet	THD<10% and pf >= 0.9	Certificate of	√	P	W	W	At lighting fixtures supplier test lab.

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ENGINEERING		QUALITY	Sign & Date		Sign & Date		Doc No:		Sign & Date		Name	Seal
Prepared by:	Sign & Date 09.07.2020	Name MEET SAGAR SINGH RAJPAL	Checked by:	Sign & Date 09.07.20	Name KUNAL GANDHI	Seal						
Reviewed by:	Digitally signed by PRAVEEN DUTTA	Name PRAVEEN SINGH	Reviewed by:	Digitally signed by RITESH KUMAR JAISWAL	Name RITESH KUMAR JAISWAL							

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c=IN
Date: 2020.07.10 21:31:29
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		CUSTOMER :					QP NO.:PE-QP-999-558-E001, R04		DATE: 23.06.2020	
		PROJECT:					PO NO.:		DATE:	
		ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS			SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 8 OF 10	


SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/ N				9	* D	**	

					e per type	e per type			compliance				
9	LED driver: Precision current control check	Major	Electrical	1 Sample per type	1 Sample per type	Approved data sheet	Approved data sheet	Inspection report	√	P	W	W	
10	LED driver: Open circuit protection simulation check	Major	Electrical	1 Sample per type	1 Sample per type	Approved data sheet	Approved data sheet	Inspection report	√	P	W	W	
11	LED driver: short circuit protection simulation check	Major	Electrical	1 Sample per type	1 Sample per type	Approved data sheet	Approved data sheet	Inspection report	√	P	W	W	
12	LED driver: over temperature protection simulation check	Major	Electrical	1 Sample per type	1 Sample per type	Approved data sheet	Approved data sheet	Inspection report	√	P	W	W	
13	LED driver: overload protection simulation check	Major	Electrical	1 Sample per type	1 Sample per type	Approved data sheet	Approved data sheet	Inspection report	√	P	W	W	
14	LED driver: surge protection compliance check	Major	Electrical	-	-	Approved data sheet	Certificate of compliance that surge protection is provided.	Certificate of compliance	√	V	V	V	

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ENGINEERING		QUALITY	Sign & Date		Doc No:			
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal	Reviewed by:	
Praveen	09.07.2020	MEET SAGAR SINGH RAJPAL	Praveen	09.07.20	KUNAL GANDHI			
Reviewed by:	Digitally signed by Praveen Dutta DN: cn=Praveen Dutta, o=BHEL, ou=PS-PEM, Noida, email=praveendutta@bhel.in, c=IN	Reviewed by:	Digitally signed by RITESH KUMAR JAISWAL	Date: 2020.07.10 20:31:35 +05'30'			Approved by:	

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	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS			STANDARD QUALITY PLAN				SPEC. NO :		DATE:	
	CUSTOMER :			PROJECT:				QP NO.:PE-QP-999-558-E001, R04		DATE: 23.06.2020	
	ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS			SYSTEM:STATION LIGHTING SYSTEM				PO NO.:		DATE:	
								SECTION: II		SHEET 9 OF 10	
SL NO.	COMPONENT & OPERATIONS	CHARACTERIST ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTAN CE NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
1	2	3	4	5	6	7	8	9	* D	** M C N	
					M C/ N						


3.0 JUNCTION BOXES & RECEPTACLES

A	Acceptance Tests													
1	Acceptance Tests	Dimensions	Major	MEASURE MENT	100%	-	Appd Drawing	Appd Drawing	Inspection report		P	V	-	Components shall be of approved Make
2		Paint Shade/ Thickness	Major	VISUAL/ME AS.	SAMP LE	-	Appd Drawing	Appd Drawing	Inspection report		P	V	-	At the time of final Inspection
3		HV/ IR	Major	ELECT.TES TS	100%	-	2KV AC FOR 1 MINUTE	2KV AC FOR 1 MINUTE	Inspection report		P	V	-	
4		Degree Of Protection	Major	TEST	1/SIZE	-	IS:2147	IS:2147	TEST CERT.	√	P	V	V	
5		Special tests if any, explosion proof etc.	Major	TEST	1/SIZE	-	IS:2148	IS:2148	TEST CERT.	√	P	V	V	
6		Operation Check	Major	TEST	10%	-	Appd Drawing	Appd Drawing	Inspection report		P	V	-	
7		Mechanical Interlock	Major	TEST	10%	-	Appd Drawing	Appd Drawing	Inspection report		P	V	-	
4.0 PACKING														
	PACKING	Soundness of Packing against transit damage	Major	Visual	100%	100%	BHEL approved document	BHEL approved document	Inspection report	√	P	W	-	

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Praveen	09.07.2020	MEET SAGAR SINGH RAJPAL		09.07.20	KUNAL GANDHI				Approved by:				
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			ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS		SYSTEM:STATION LIGHTING SYSTEM		SECTION: II		SHEET 10 OF 10	
SL NO.	COMPONENT & OPERATIONS	CHARACTERIST ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTAN CE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9	* D	** M C N
					M C/ N					

NOTES:

1. P/V*- means test will be performed either by lighting fixture supplier or their sub-vendor and verified by lighting fixture supplier.
2. Project specific QP shall be based on customer requirement. In case, any changes in QP commented by customer at contract stage shall be carried out by bidder without any implication to BHEL/ Customer.
3. For export jobs, BHEL technical specification for seaworthy packing for export jobs is to be followed.
4. Packing shall be suitable for storage at site in tropical climatic conditions.
5. Latest revision/ year of issue of all the standards (IS/ ASME/ IEC etc.) Indicated in QP shall be referred.
6. BHEL reserves the right for conducting repeat test if required.
7. Items like ceiling fans, emergency lighting unit, flexible conduit, 24V supply module, ladders, hume pipe, switchboxes, exit signs etc. Will be cleared based on COC (certificate of compliance).
8. After packing and prior to issue MDCC, photographs of items to be dispatched shall be sent to BHEL purchase group for review.

LEGENDS:

*Records, identified with "Tick"(√) shall be essentially included by supplier in QA Documentation,
 ** **M:** Supplier/ Manufacturer/ Sub-Supplier, **C:** Main supplier/ BHEL/ Third Party Inspection Agency, **N:** Customer,
P: Perform, **W:** Witness, **V:** Verification, as appropriate
MA: Major, **MI:** Minor, **CR:** Critical, **D:** Documentation

BHEL			BIDDER/ SUPPLIER			FOR CUSTOMER REVIEW & APPROVAL		
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	09.07.2020	MEET SAGAR SINGH RAJPAL		09.07.20	KUNAL GANDHI	Approved by:		
Reviewed by:		PRAVEEN DUTTA	Reviewed by:	Digitally signed by JAISWAL	RITESH KUMAR			


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732157/2022/PS-PEM-EI

	TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS		SPECIFICATION NO. PE-TS-435-558-E006	
			VOLUME II	
			SECTION - I	
	2 X 660MW UDANGUDI STPP STAGE-I		REVISION 0	DATE: 10.03.2022
		SHEET 1 OF 1		

ANNEXURE-A TO QP

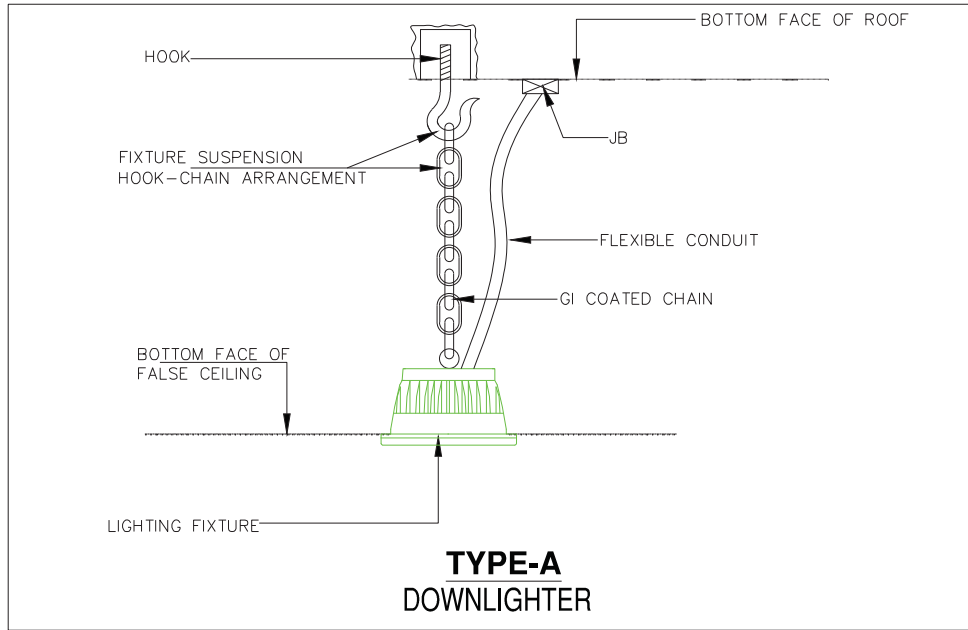
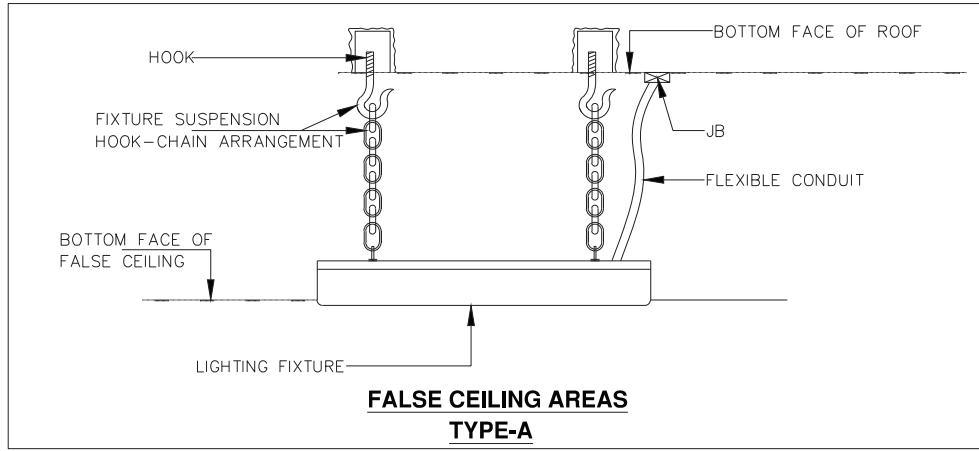
PACKING SPECIFICATIONS- LIGHTING FIXTURES, LAMPS & MISC. ITEMS

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.

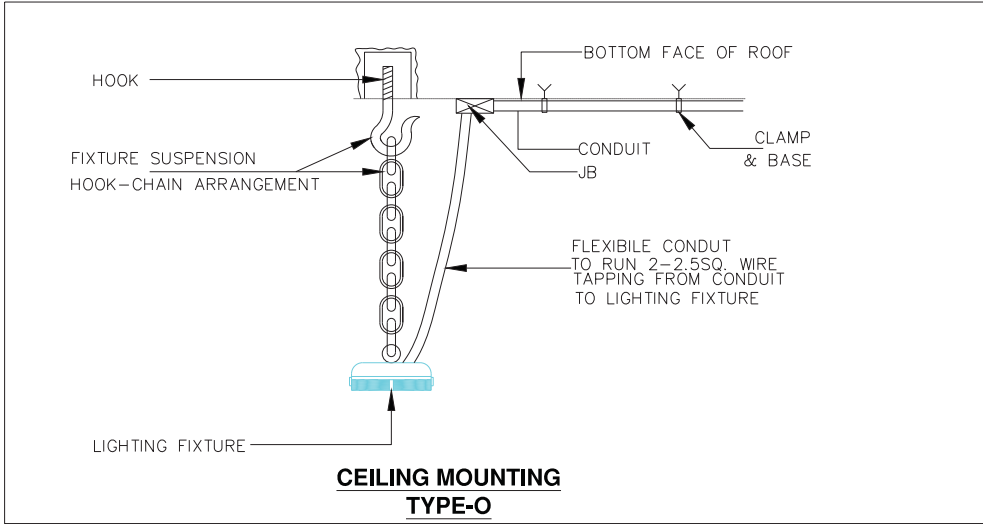
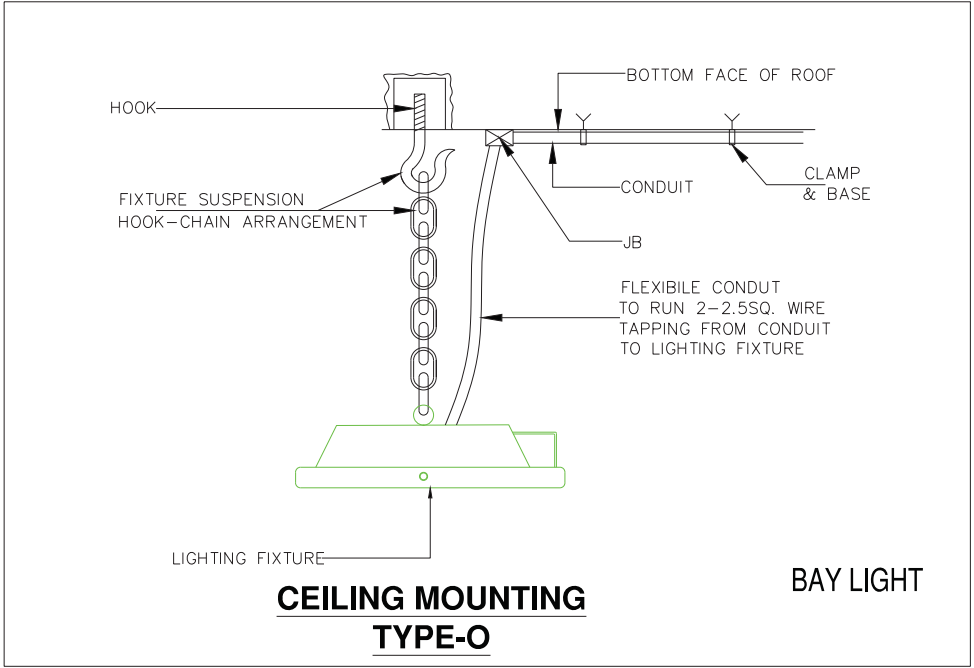
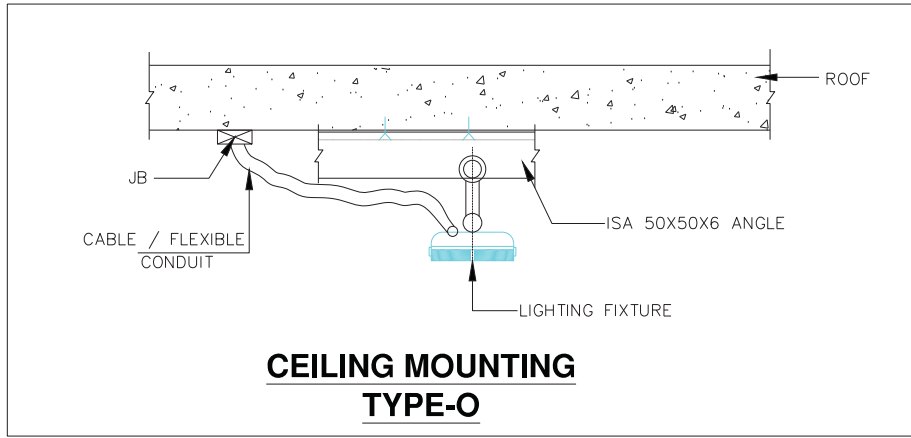
Note: In case Manufacturer has a different packing standard which is equivalent or better same to be submitted for approval during contract stage.

ANNEXURE-I



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.

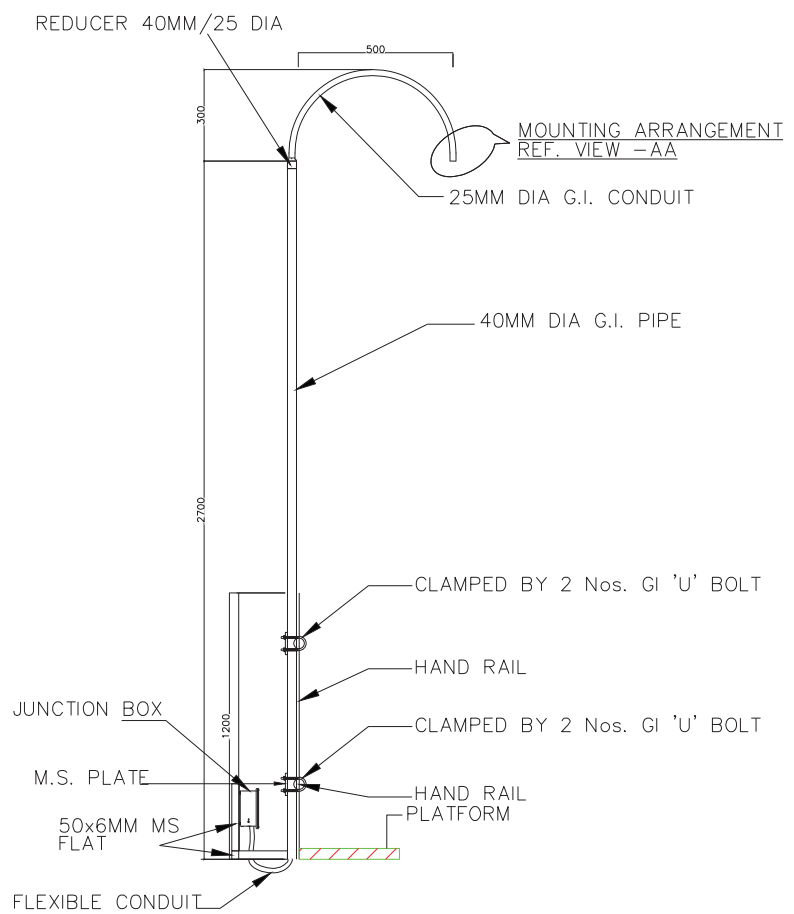
2. In Lighting layout, Mounting arrangement also shown. If any Discrepancy found on both documents than Consult with Design incharge/Site incharge.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required 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 hot dip galvanized as per BOQ/TS.



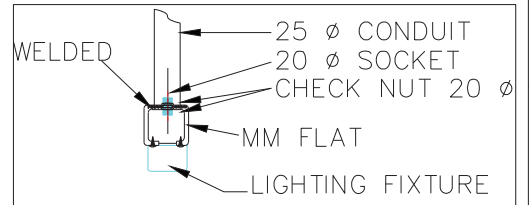
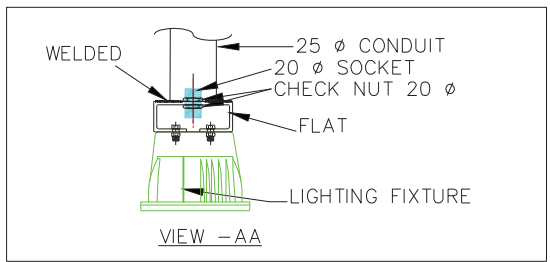
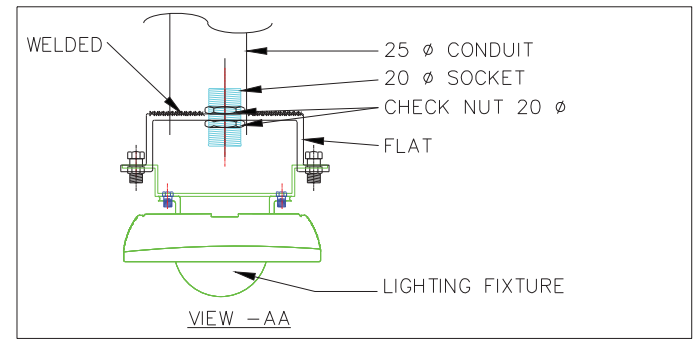
- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
 2. In Lighting layout, Mounting arrangement also shown. If any Descrpency found on both documents than Consult with Design incharge/Site Incharge.
 3. Quantity and Material shown in drawings are indicative 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 hot dip galvanized as per BOQ/IS.

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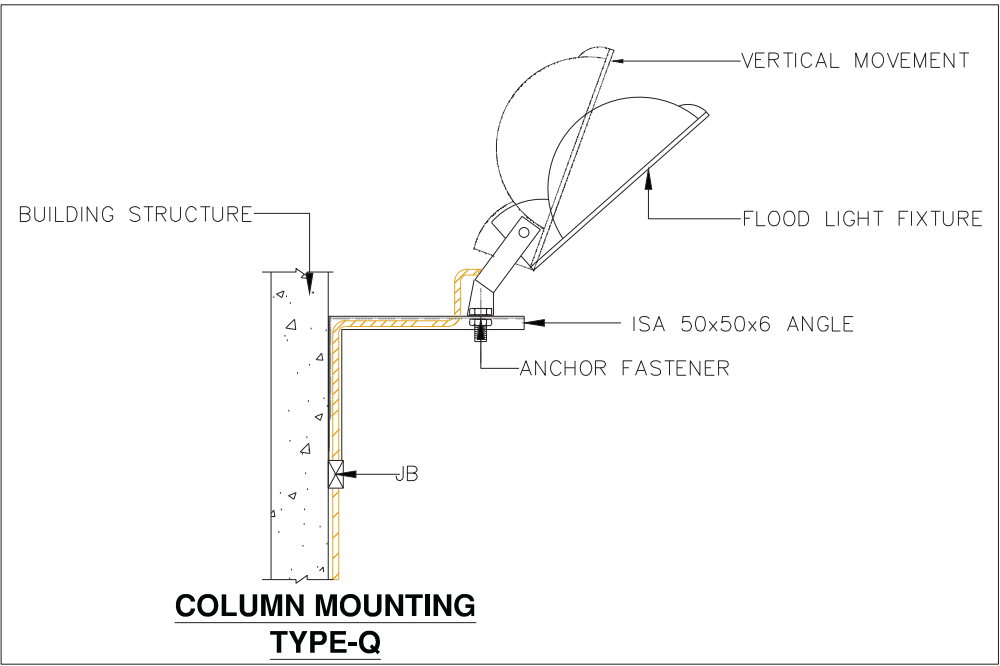
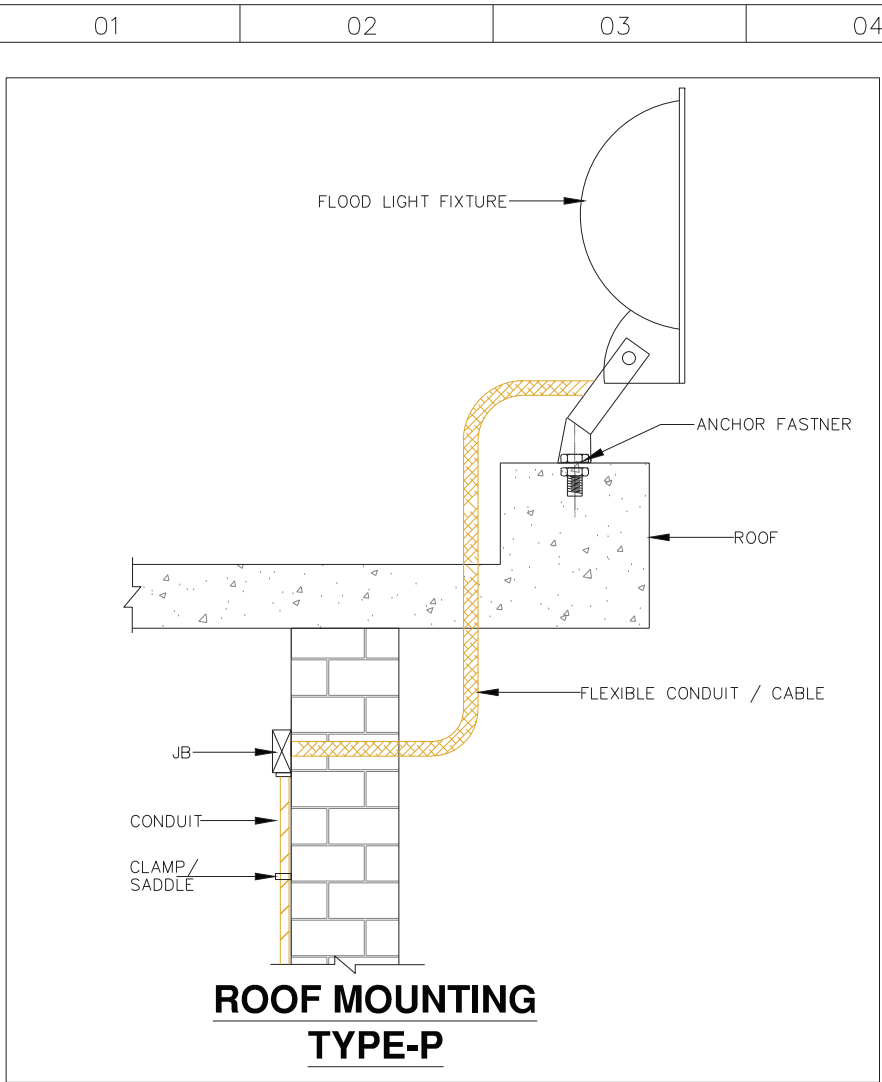


HAND RAIL MOUNTING TYPE-I

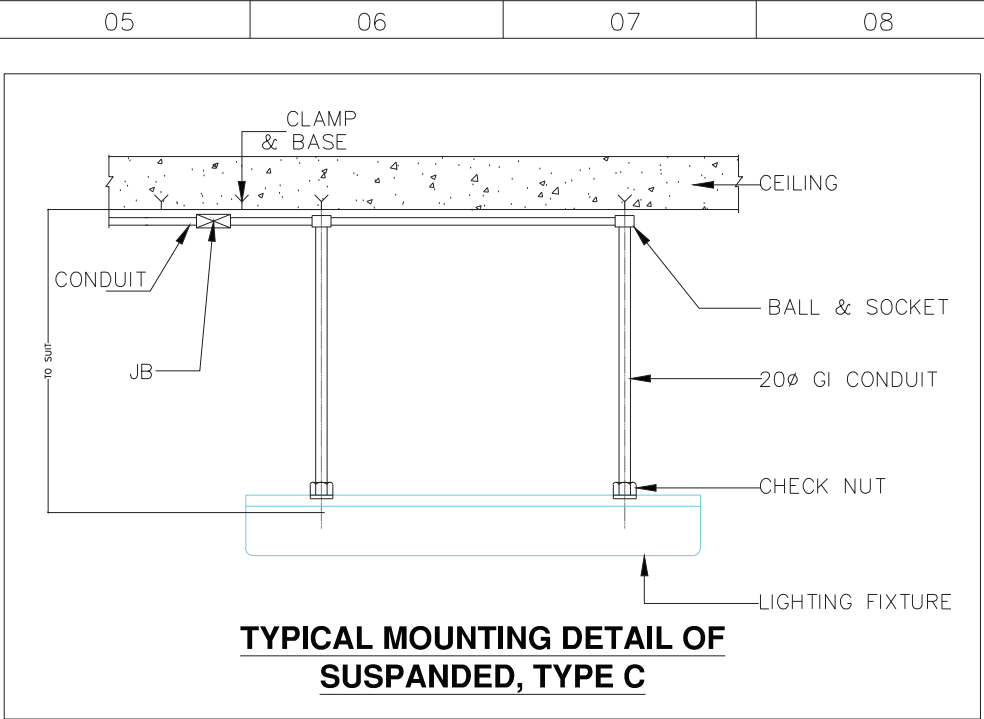
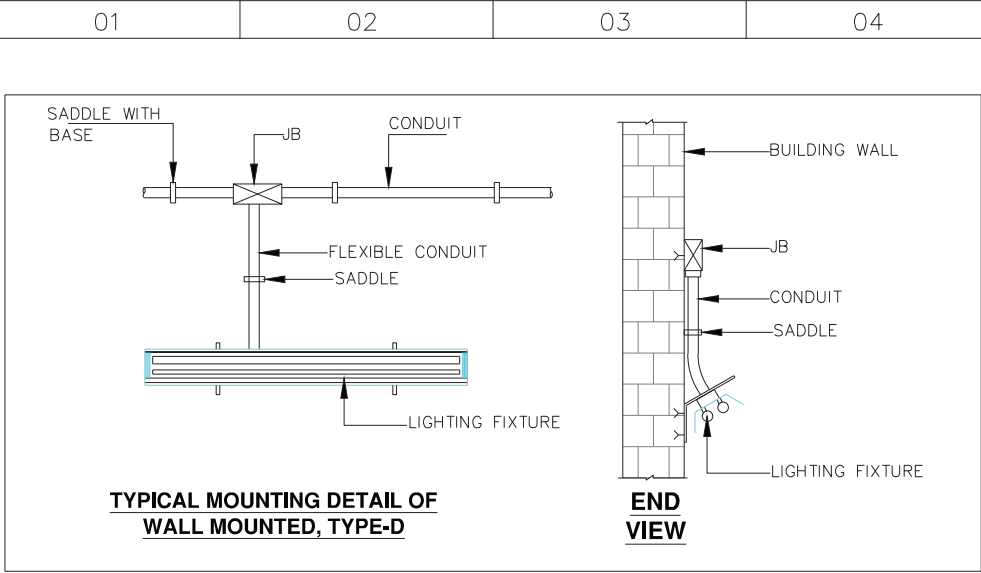


- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
 2. In Lighting layout, Mounting arrangement also shown, if any Descrepancy found on both documents than Consult with Design incharge/Site incharge.
 3. Quantity and Material shown in drawings are indicative 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 hot dip galvanized as per B00/TS.

01 02 03 04 05 06 07 08

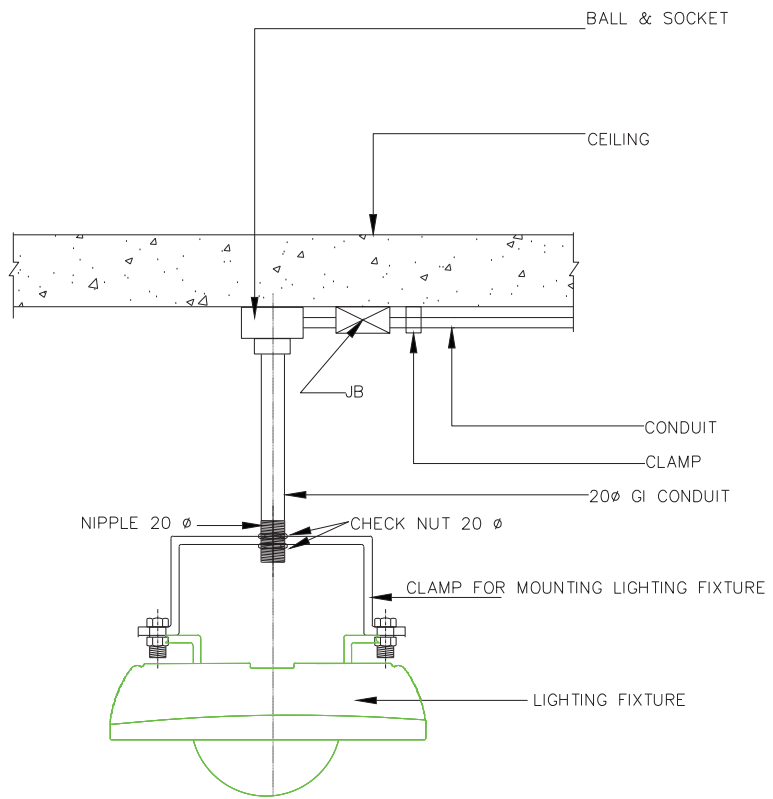


- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
 2. In Lighting layout, Mounting arrangement also shown. If any Descrepency found on both documents than Consult with Design incharge/Site incharge.
 3. Quantity and Material shown in drawings are indicative 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 hot dip galvanized as per BQQ/TS.

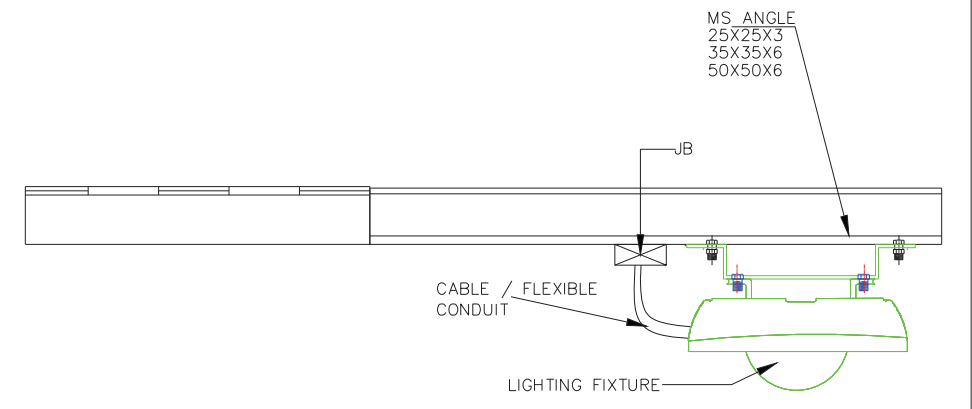


- General Notes:
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 2. In Lighting layout, Mounting arrangement also shown. If any Discrepancy found on both documents than Consult with Design incharge/Site incharge.
 3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
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01 02 03 04 05 06 07 08



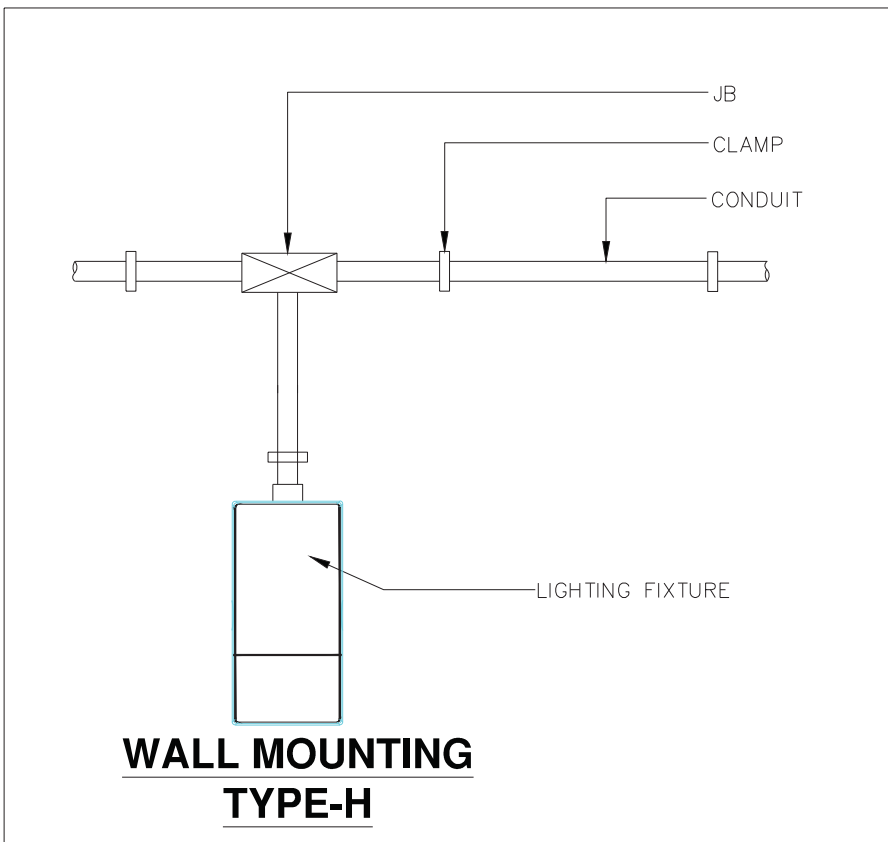
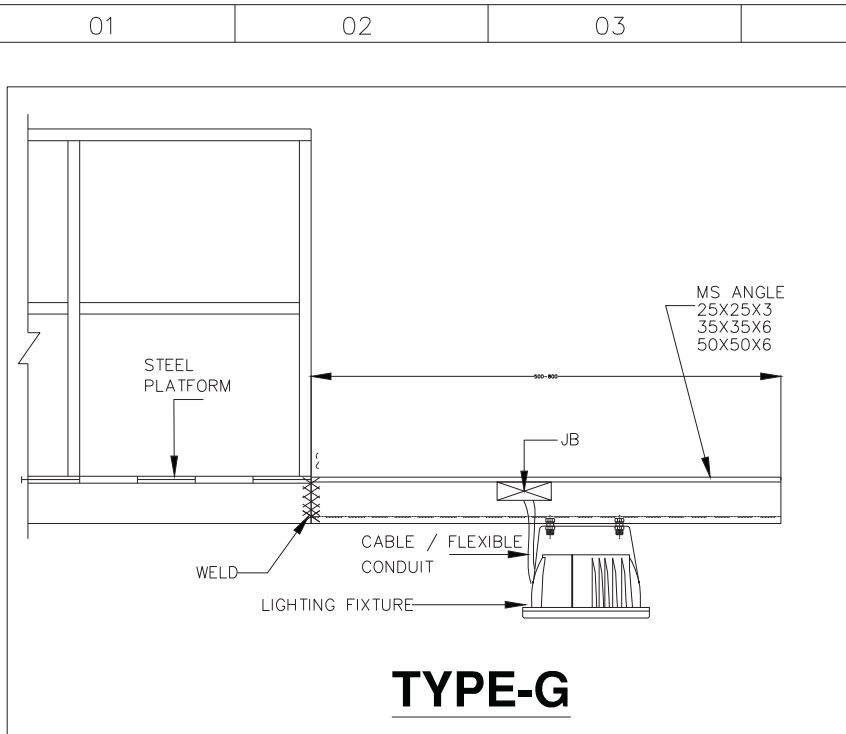
**SUPPORTED FROM CEILING
TYPE-F**



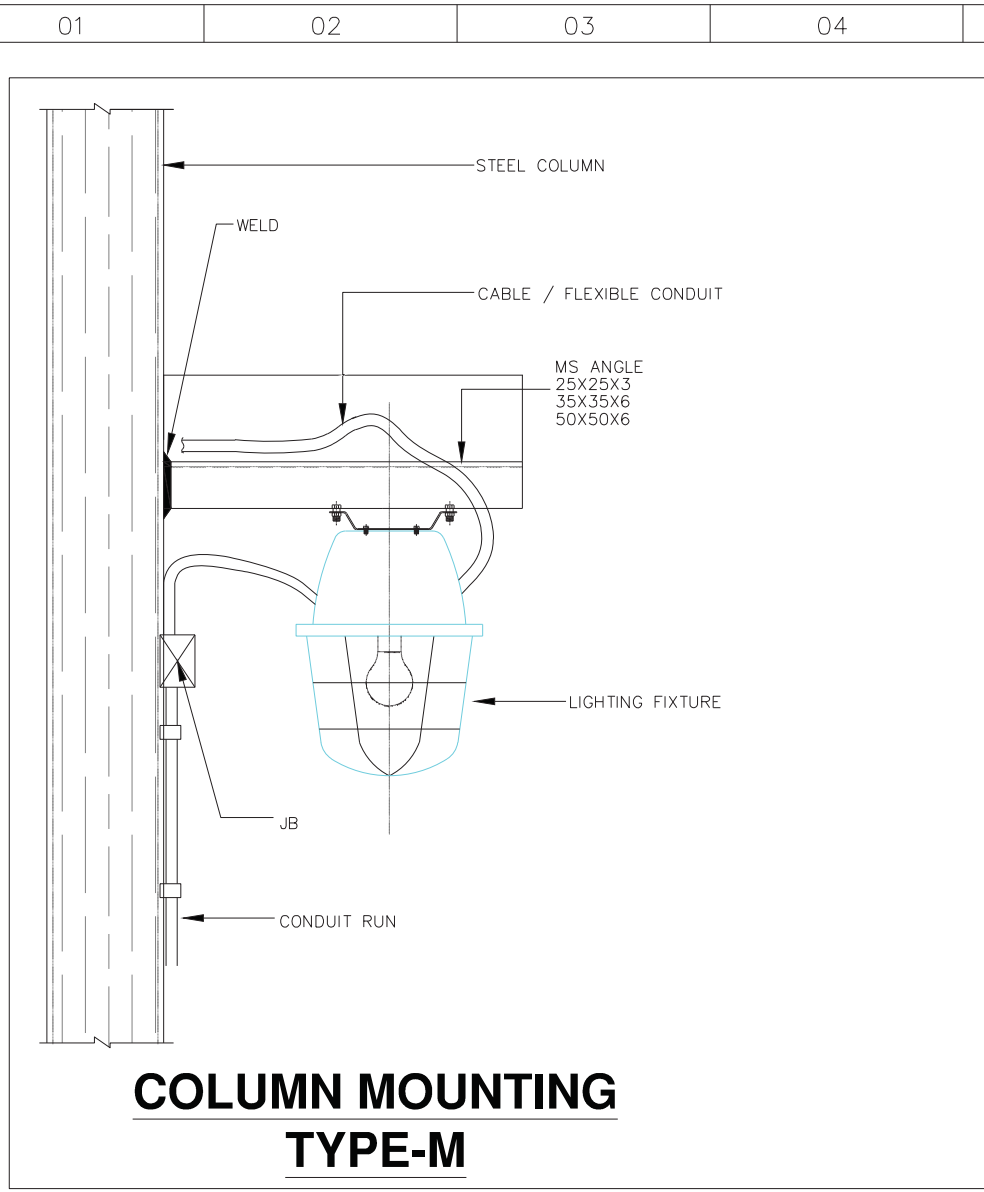
**SUPPORTED FROM CHANNEL/
STRUCTURAL STEEL
TYPE-G**

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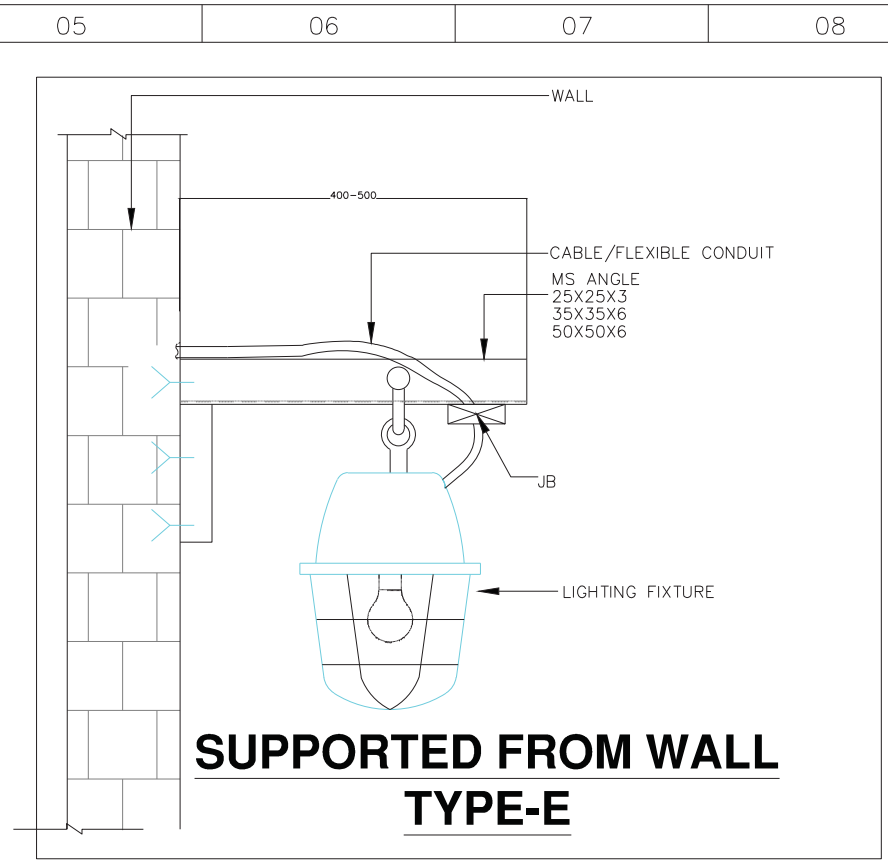
01 02 03 04 05 06 07 08



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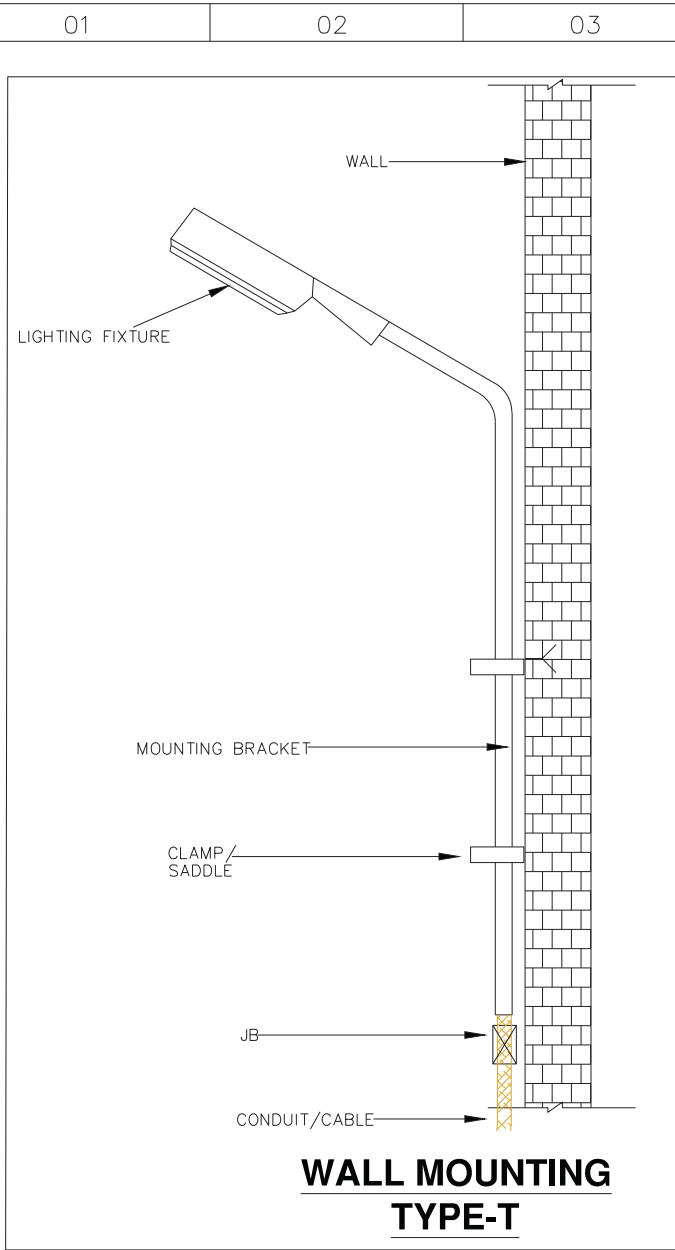
**COLUMN MOUNTING
TYPE-M**



**SUPPORTED FROM WALL
TYPE-E**

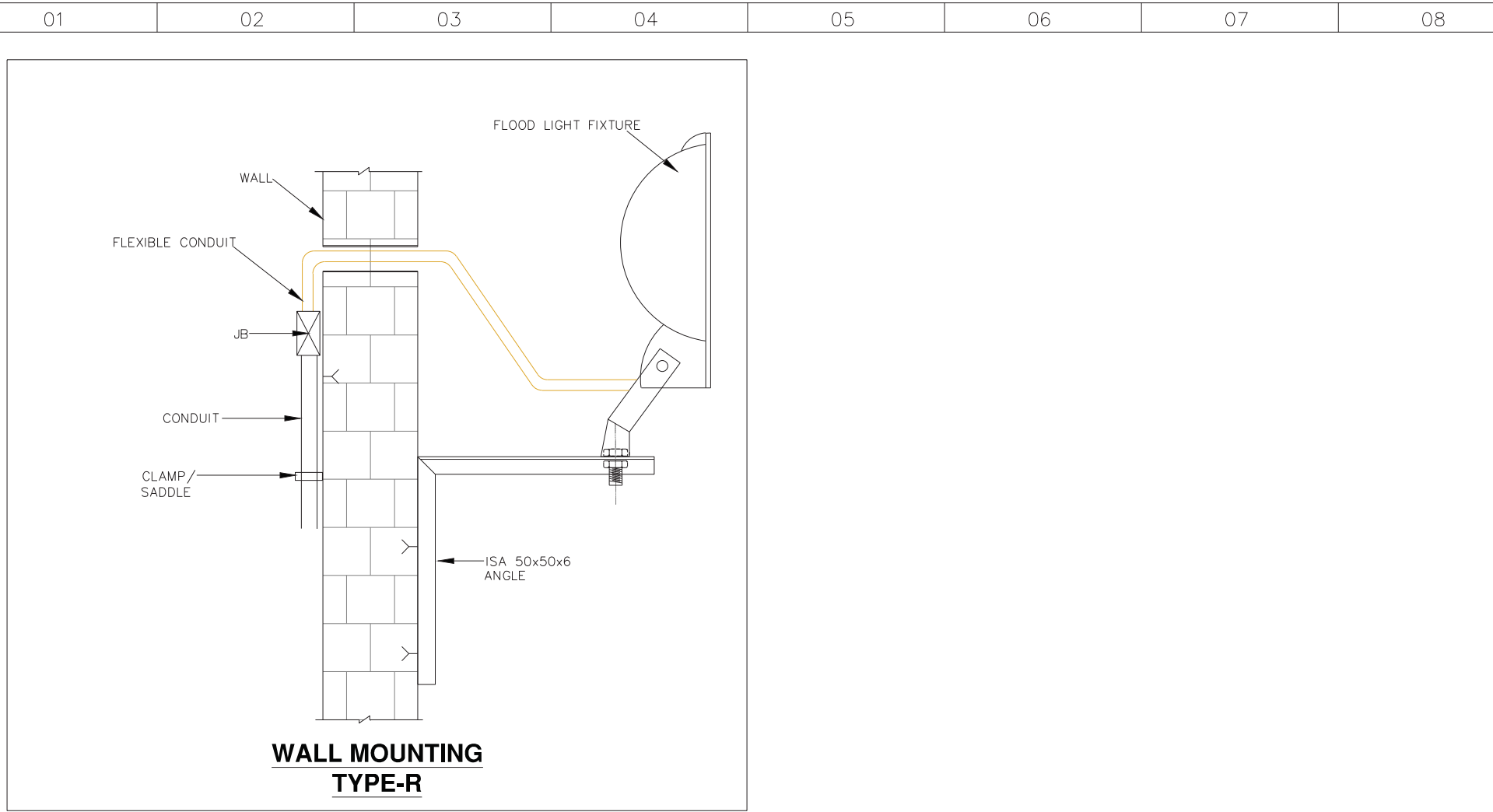
General Notes:

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General Notes:

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