

VOLUME II

1X660 MW BHUSAWAL TPS UNIT 6

TECHNICAL SPECIFICATION

FOR

**LIGHTING FIXTURES, LAMPS AND MISCELLANEOUS
ITEMS**


SPECIFICATION NO: *PE-TS-415-558-E001*

REVISION: 0



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


321895/2021/PS-PEM-EL

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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

| | | | |
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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.

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, 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 of this technical specification. 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.

2.0 BILL OF QUANTITIES:

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

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.

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4.0 DOCUMENTATION

4.1 Documents required along with the technical offer: -

- Signed & Stamped copy of Compliance certificate
- Duly filled in signed & stamped copy of scope matrix for broad activities (Annexure-D to Section-I)
- Signed & stamped copy of unpriced price schedule with “quoted” word indicated against all items.
- Duly filled in signed & stamped copy of Datasheet-B.

4.2 Documents required after award of LOI/PO shall be as per Annexure -B (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 | 5.2.1(n), 4 : Page-17 of 38 | Referred clause shall be read as: “The LED chip efficacy shall be min 120 Lm/W” |
| 2 | 5.2.1(n), 5 : Page-17 of 38 | Referred clause shall be read as: “The LED used in the luminaires shall have colour rendering index (CRI) of Min 80 . Colour designation of LED shall be “cool day light” (min 5700K) type for indoor areas. However, for outdoor areas, the colour temperature of LED shall be min. 4000K, including rough & dust prone areas. LED shall conform to the LM 80 requirements ” |
| 3 | 5.2.1(n), 15 : Page-17 of 38 | Following protection to be added under clause 15: ➤ Surge Protection |
| 3 | Add new clause 7.2.1 after clause 7.2 in Section-II : 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. |
| 4 | 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 Auto Cad dwgs to BHEL. |
| 5 | New Clause | Following items are excluded from the supply of this package: Poles, Mast, LDB, WDB, Lighting panels, Rigid conduit, and |

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| | | PVC Wires. |
| 6 | New Clause | Pedestal Fan will have 400mm Sweep (50-65 Wattage). |
| 7 | Additional Clause no.6 to be added under Annexure-I of section-II as below:- | |

6.0

| SL. No. | Type of Luminaire | Description | Total Luminous flux (Lumen) of luminaire- Minimum value | Measured Electrical Input Power(Watt)- Maximum value |
|---------|-------------------|--|---|--|
| 1 | 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 |
| 2 | 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 |
| 3 | 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 |
| 4 | 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 |
| 5 | 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 |
| 6 | 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 |

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| 7 | FC32 (LED) | Decorative, surface mounted LED fixture having integral driver | 3780 | 42 |
| 8 | FC81(LED) | Corrosion proof, totally enclosed type LED fixture having integral driver. | 3780 | 42 |
| 9 | SB11 (LED) | Medium bay, Industrial type LED fixture | 10080 | 112 |
| 10 | SB02 (LED) | High Bay Industrial type LED fixture | 16920 | 188 |
| 11 | SB03 (LED) | High Bay Industrial type LED fixture suitable for turbine hall operating floor (mounting height >10 m) | 24750 | 275 |
| 12 | SF63 (LED) | Flood light, heavy duty type LED fixture | 16920 | 188 |
| 13 | SF64 (LED) | Flood light, heavy duty type LED fixture | 27000 | 300 |
| 14 | SF66 (LED) | Flood light, heavy duty type LED fixture | 45000 | 500 |
| 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 |
| 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. | 6000 | 94 |
| 20 | Downlighter(LED) | Recessed Mounted Downlighter with Integral driver aesthetically designed for Control Room/ Office | 1500 | 18 |

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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 minimum luminous flux & maximum measured electrical input power are specified above for the luminaire (including any accessories like driver module etc). These values 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.
- 7) COVE LIGHT(LED) shall be 5 MTR strip per piece. Cove lighting shall be provided for better aesthetics in false ceiling of common control room(CCR), Service building, Canteen and ESP Control room.

7.0 TESTS

- 7.1 Vendor shall submit the type test reports of LED Luminaires conducted within last five years as on date of bid opening i.e. 06.08.18 during detailed engineering for customer approval. These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.

Following type test reports for LED as per standards shall be submitted for approval.

1. Visual and Dimension check
2. Proof of procurement of LEDs
3. Safety tests
 - a) Marking
 - b) Construction
 - c) Provision for Earthing
 - d) External and Internal wiring
 - e) Protection against electrical shock
 - f) Endurance and Thermal
 - g) Insulation resistance & electrical strength
 - h) Resistance to heat fire & tracking
 - i) Resistance to Humidity
4. Fire Retardant test
5. Performance tests (electrical, Photometric color and Life)
6. Burn-in Test
7. Power Cycling
8. Temperature rise test
9. Emission Tests
 - a) Radiated & conducted emission
 - b) Harmonics & flickers
10. Immunity tests

In addition, following test reports to be submitted for LED chip/LED luminaire:

- a) LED parameters like Lumen per watt, CRI, Beam angle from manufacturer.
- b) LM 80/IS: 16105 report.
- c) LM 79/IS: 16106 report.

However if the vendor is not able to submit the valid type test reports, vendor shall conduct all such tests under this contract at no additional cost to the owner either at third party lab or in presence of client/owners representative and submit the reports for approval.

7.2 Acceptance Test and Routine Test

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- 7.2.1 All lighting fixtures, lamps and other items shall be subjected to acceptance and routine test, as per relevant specified standards.
- 7.2.2 Junction boxes, switch boxes, receptacle enclosure etc. shall be subjected to physical and dimensional checks also.

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9 LIGHTING SYSTEM DESIGN:

- 9.1 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.
- 9.2 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.
- 9.3 LED medium bay fixtures will be installed in areas with sufficient minimum headroom of 5 meter.

However, above minimum headroom may or may not be feasible in boiler area and fixture will be mounted on columns/bottom of platform as per site requirement. On boiler platform walkway, fixtures will be installed on handrails only if mounting structure is not available.

- 9.4 Flame proof LED lighting fixtures will be installed in Fuel Oil areas and hazardous area as per area classifications. All highbay fixtures will have vibration damper.
- 9.5 In general, the type of fixtures, type of luminaires and illumination levels to be achieved will be as per enclosed Annexure-I.
- 9.6 The lighting fixtures in the plant area will be group controlled from lighting panel. The lighting fixtures in office areas, control rooms etc. will be controlled by switches.
- 9.7 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 |
- 9.8 Outdoor areas like Fuel oil tank area, open store etc. shall have flood light fixtures mounted on flood light poles.


10 ILLUMINATION DESIGN CALCULATION:

- 10.1 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)

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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 : Floor level

The Room Index is calculated by the following formula:

$$\text{Room Index} = \frac{L \times W}{(L + W) \times MH}$$

where, MH = Mounting height of luminaire.

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

| | Ceiling (rc) | Wall (rw) | Floor (rf) |
|--|--------------|-----------|------------|
| For air-conditioned area, switchgear room, control room, office area, TG Hall, equipment rooms. | 70 | 50 | 10 |

Values of Maintenance Factor (MF), which includes the luminaire depreciation factor also as per IS-3646, will be considered as given below:

| | |
|-------------------------------------|------|
| Boiler area/ Outdoor area | 0.6 |
| Control room & air conditioned area | 0.75 |
| Switchgear/ MCC rooms | 0.65 |
| General indoor area | 0.6 |

- 10.2 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.

Average maintenance factor for outdoor and road lighting : 0.6

For outdoor lighting and road lighting ratio of minimum to average illumination will not be less than 0.3 and for minimum to maximum will not be less than 0.05.

11 LIGHTING SYSTEM DESCRIPTION

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


The sources of power lighting are as below :

- 415V AC Normal (ACN) Supply from different station PMCCs /MCCs
- 415V AC Emergency (ACE) Supply from Emergency Board
- 220V DC Emergency Supply from DC Distribution Board
- 24V AC Supply for maintenance

For main plant area normally all AC luminaries will be in service on normal AC supply.

Approximately distribution of AC Luminaries on AC normal and AC emergency shall as below:

| | |
|----------------------------|------|
| AC Normal (ACN) supply: | 75 % |
| AC Emergency (ACE) supply: | 25 % |

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Normally all DC luminaries shall be 'OFF'. Upon failure of AC supply, DC luminaries shall be automatically switched 'ON'. On restoration of AC Emergency lighting through DG, DC luminaries shall be put-off automatically after a time gap of about three minutes following the restoration of lighting to ACN or ACE lighting system.

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.

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.

In off-site areas/odd locations (BHEL scope), for safe movement of personal during emergency, The Remote Emergency light unit (ELU) shall be provided with self contained battery, automatic charger, inverter with **LED/CFL lamp**.

12 AC Normal Lighting Systems:

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


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

LDB TYPE-I (100KVA)

| | |
|----------------------------|--|
| Transformer rating: | 100 kVA |
| Transformer voltage ratio: | 415 / 415 Volt, taps of +5% to -5% in steps of 2.5%. |
| Transformer type: | Non-Encapsulated |
| Distribution Panel type: | Single front fixed type |
| LDB Configuration: | Single incomer |
| Incomer type: | TPN SFU |
| Incomer rating: | 200A |
| Outgoing feeder type: | TPN SFU |
| Outgoing feeder rating: | 63A |
| Vector group | Dyn11 |
| Outgoing feeder quantity: | 12 nos. |

LDB TYPE-II (50KVA)

| | |
|----------------------------|--|
| Transformer rating: | 50 kVA |
| Transformer voltage ratio: | 415 / 415 Volt, taps of +5% to -5% in steps of 2.5%. |
| Transformer type: | Non-Encapsulated |
| Distribution Panel type: | Single front fixed type |
| LDB Configuration: | Single incomer |
| Incomer type: | TPN SFU |
| Incomer rating: | 100A |
| Outgoing feeder type: | TPN SFU |
| Vector group | Dyn11 |
| Outgoing feeder rating: | 63A |

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Outgoing feeder quantity: 8 nos.

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

Incomer type: TPN SFU
 Incomer rating: 63A
 Outgoing feeder type: SPN MCB
 Outgoing feeder rating: 20A
 Outgoing feeder quantity: 18 nos. / 12 nos./ 6 nos.
 Short circuit rating: 9kA
 ELCB in Incomer: Yes

Street lighting panel as per details given below is envisaged:

Incomer type: TPN SFU
 Incomer rating: 63A
 Outgoing feeder type: TPN MCB
 Outgoing feeder rating: 20A
 Outgoing feeder quantity: 6 nos.
 Short circuit rating: 9kA
 ON/ OFF control: With Timer & photocell
 ELCB in Incomer: Yes

13 AC Emergency Lighting Systems:

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


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

ELDB TYPE-I (100KVA)

Transformer rating: 100 kVA
 Transformer voltage ratio: 415 / 415 Volt, taps of +5% to -5% in steps of 2.5%.
 Transformer type: Non-Encapsulated
 Distribution Panel type: Single front fixed type
 LDB Configuration: Single incomer
 Incomer type: TPN SFU
 Incomer rating: 200A
 Outgoing feeder type: TPN SFU
 Outgoing feeder rating: 63A
 Vector group: Dyn11
 Outgoing feeder quantity: 12 nos.

ELDB TYPE-II (50KVA)

Transformer rating: 50 kVA
 Transformer voltage ratio: 415 / 415 Volt, taps of +5% to -5% in steps of 2.5%.
 Transformer type: Non-Encapsulated
 Distribution Panel type: Single front fixed type

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LDB Configuration: Single incomer
 Incomer type: TPN SFU
 Incomer rating: 100A
 Outgoing feeder type: TPN SFU
 Outgoing feeder rating: 63A
 Vector group: Dyn11
 Outgoing feeder quantity: 8 nos.

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

Incomer type: TPN SFU
 Incomer rating: 63A
 Outgoing feeder type: SPN MCB
 Outgoing feeder rating: 20A
 Outgoing feeder quantity: 18 nos. / 12 nos. / 6 nos.
 Short circuit rating: 9kA
 ELCB in Incomer: Yes

14 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 normally 'OFF'. Upon failure of AC supply, DC luminaires shall be automatically switched 'ON' from DC supply system. DCLDB shall be equipped with AC under voltage relay and contactor for emergency auto changeover scheme.

DCLDBs as per details given below is envisaged:


Distribution Panel type: Single front fixed type
 DC Incomer type: DP Switchfuse unit with contactor
 DC Incomer rating: 125A
 AC Incomer type: Not applicable
 AC Incomer rating: Not applicable
 Outgoing feeder type: DP Switchfuse unit
 Outgoing feeder rating: 32A
 Outgoing feeder quantity: 12 nos.

DCLPs as per details given below is envisaged:

Incomer type: DP Switchfuse unit
 Incomer rating: 32A
 Outgoing feeder type: DP MCB
 Outgoing feeder rating: 20A
 Outgoing feeder quantity: 6 nos.

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- 15** The LDBs will 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 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.
- 16** **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 |
| 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 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 |
- 17** **Emergency EXIT lamps:**
- Emergency exit lamps backed up by battery shall be provided at strategic locations of the building for safe exit of personnel. These exit lamps will remain ON all the time and normally received power supply from ACELP.
- Exit lamp unit shall contain maintenance free Lead Acid/Ni-Cd battery with 2.5 hours backup capacity.
- 18** ELUs shall contain maintenance free Lead Acid/Ni-Cd battery with 4 hours backup capacity. Each ELU will have battery charger and 2x9W LED/ CFL lamp.


| | | |
|---|---|---|
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19 STREET LIGHTING / OUTDOOR LIGHTING

- 19.1 The roads within BHEL scope as per contract will be considered for lighting.
- 19.2 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.
- 19.3 For street lighting, street light pole will be used. For outdoor area lighting lighting if required flood light pole will be used. Pole type shall be as below:
- Pole height: 13 meter for primary roads / 11 meter for secondary roads
- Pole construction type: Fabricated, swaged, steel tubular poles
- Pole type: Painted
- The pole shall be coated with bituminous preservative paint on inside as well as embedded outside surface. Exposed surface shall be coated with two coats of metal primer (comprising of red oxide and zinc chromate in synthetic medium). The technical details of poles will be as per IS-2713. The poles shall be equipped with junction boxes and all other required accessories.
- 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.
- 19.4 High mast tower will be used, if required. High mast tower will be 30 meter high, hot dip galvanised and polygonal shaped. The location of high mast (if used) will be decided during detailed engineering.

20 LOW VOLTAGE POWER SERVICES

- 20.1 Different type of receptacles as per details below will be provided:
- (i) Decorative receptacle:
At least 01 number 5/15A, 3-Pin, 240V AC decorative socket will be provided in office, store, cabin etc.
- (ii) Industrial receptacle:
At least 01 number 20A, 5-Pin, 240V AC industrial type receptacles will be provided at suitable location in plant building. The receptacles shall be provided at interval of 20m or part thereof. All receptacles will be controlled with a switch. In hazardous area receptacles will be of flameproof type.
- (iii) Welding receptacle:
63A, 3-phase 4-wire, 5 pin, 415V AC welding receptacles with isolating switch will be provided at (a) 1 no. at each floor of TG building. (b) 1 no. in each boiler platform. (c) 1 no. each in pump houses (d) 1 no. in each ESP, Transformer yard, battery room. Maximum four (4) nos. welding receptacles shall be fed through one feeder. In hazardous areas these receptacle will be located in MCC room. Welding receptacles in TG building and Boiler areas shall be fed from 415V Welding Swbd/ PMCC #0DL. Welding receptacles in off-site areas shall be fed from nearest 415V MCC/ PMCC.
- 20.2 Based on room size, suitable nos. of ceiling fans (1200mm or 1400mm sweep) with Stepped electronic regulator shall be provided in office rooms, store rooms and social buildings which are not covered by air-conditioned and ventilation system.

| | | |
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- 20.3 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. For the maintenance of street lights, 01 no. of wheel mounted adjustable aluminium ladder shall be provided.

21 WIRING / CONDUITS

- 21.1 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 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.
- (ii) Conduits will be heavy-duty type hot dip galvanised steel conforming to IS-9537. Conduit accessories will be hot dip galvanised. In corrosive area, conduits will have suitable epoxy coating additionally.
- (iii) Flexible conduits 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.
- (v) Filling area of wires in conduit shall not exceed 40% of the conduit area.
- (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.

- 21.2 Following sizes of 1100 V grade, PVC insulated, single core, stranded copper conductor wires will be used:


| | |
|---|---------------------|
| Lighting Panel to JB's: | 6 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: | 2.5 sq. mm (Cu) |
| Panel/ JB's to flood light fixtures: | 2 x 2.5 sq. mm (Cu) |

- 21.3 Wiring in hazardous area, transformer yard will be done using 3C-2.5 sq. mm (Cu), XLPE insulated, FRLS PVC sheathed armoured cable.

22 EARTHING

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

| | |
|--|-----------------|
| Lighting Distribution Board: | GI Flat 50x6 mm |
| Lighting Panels: | GI Flat 35x6 mm |
| Lighting fixtures, receptacles, conduits, junction | 16 SWG GI wire |

| | | |
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boxes & switch boxes:

Street light pole/ flood light pole and High mast: GI Flat 50x6 mm


Electrode for Pole/ High mast earthing: 2 nos, 40 mm dia MS rod, 3 mtr long

23 Occupancy based Passive Infra-red sensors

The sensors shall be recess mounted, programmable type suitable for lighting load of 6A with variable off delay settings. The detection area shall be minimum 5 metres for standard room height of 3mt. All the calibrated settings shall be stored in non-volatile memory of PIR sensor which shall be unaffected by power supply fluctuations. Necessary 16A contactor shall be supplied alongwith each sensor & shall be located inside the switch box. Occupancy sensors shall be provided in service building in conference rooms, and cabins.

24 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 FIXTURE |
|------------|---|----------------------|---|
| 1.0 | Turbine Generator Building : | | |
| 1.1 | General Auxiliary Equipment Areas (Turbine hall other Platforms) | 200 | High/ Medium bay Industrial type LED luminaire |
| 1.2 | Cable Spreader Room | 50 | Industrial type LED luminaire |
| 1.3 | Switchgear Room | 200 | Industrial type LED luminaire |
| 1.4 | TG Building Operating Floor | 200 | High bay Industrial type LED luminaire |
| 1.5 | Main Control Rooms | 350 | Recessed type LED luminaire asthetically designed for control room/ offices |
| 1.6 | Battery Rooms | 100 | Totally enclosed corrosion proof LED luminaire |
| 1.7 | Unloading and Maintenance bay | 250 | High bay Industrial type LED luminaire |
| 2.0 | Boiler Area : | | |
| 2.1 | Boiler area and platforms | 100 | Industrial type LED well glass luminaire |
| 2.2 | Coal Bunker and Mill bay area | 100 | Industrial type LED well glass luminaire |
| 2.3 | ESP areas and Platforms | 150 | Industrial type LED well glass luminaire |
| 2.4 | ESP Control Room | 350 | Recessed type LED luminaire asthetically designed for control room/ offices |
| 3.0 | Transformer Yard : | | |
| 3.1 | General | 20 | Street/ Flood light LED luminaire |
| 3.2 | Near equipment | 50 | Street/ Flood light LED luminaire |
| 4.0 | Various Off-site Buildings : | | |
| 4.1 | Equipment Room / Switchgear Rooms | 200 | Industrial type LED luminaire |
| 4.2 | Pump Houses/ DG room / Compressor room | 150 | Medium bay Industrial type LED luminaire |
| 4.3 | DM Plant, Pre-Treatment, Chemical house, Water treatment plant etc. | 150 | Medium bay Industrial type LED luminaire |
| 5.0 | Cooling Water Pump House Area : | | |
| 5.1 | CW PH | 150 | Medium bay Industrial type LED luminaire |
| 6.0 | Road & Yard Lighting: | | |
| 6.1 | Main Roads | 20 | Street lights LED luminaire |
| 6.2 | Secondary Roads | 10 | Street lights LED luminaire |
| 6.3 | Perimeter (Compound) Lighting | 10 | Street lights LED luminaire |
| 7.0 | Service Building | | |
| 7.1 | Main Office /conference room/ Staff Room | 300 | Recessed type LED luminaire asthetically designed for control room/ offices |
| 7.2 | Non-Office /Service Areas | 300 | Recessed/ Surface/ Suspended type LED luminaire |
| 7.3 | Toilet passage | 50 | Recessed/ Surface/ Suspended type LED luminaire |
| 8.0 | Facility building, Canteen etc. | | |
| | | 150 | LED luminaire |

| | | |
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ANNEXURE-I

| | | | |
|-------------|---|------------|---|
| 9.0 | General : | | |
| 9.1 | Corridors, Walkways, Staircase, Lockers etc. | 50 | LED luminaire |
| 9.2 | Toilets, Wash Rooms, etc. | 70 | LED luminaire |
| 10.0 | Fuel Oil Tank area | | |
| 10.1 | Tank area | 50 | Flood light LED luminaire |
| 10.2 | Fuel oil PH | 150 | Flame proof LED type luminaire |
| 11.0 | DC Emergency area Main Control room | 50 | LED Downlight luminaire, recessed type with cylindrical reflector |
| 12.0 | DC Emergency other area | 20 | LED Industrial luminaire |
| 13.0 | Outdoor storage handling and unloading area | 20 | Industrial type LED Luminaire |
| 14.0 | Permanent stores/ Workshop building | 150 | High bay/ Medium bay/ Industrial type LED luminaire |
| 15.0 | a) Laboratory General b) analysis area | 150 300 | Industrial type LED Luminaire/ Corrosion proof LED Luminaire |
| 16.0 | Garage/ Car Parking | 50 | LED luminaire |
| 17.0 | Building periphery Lighting | 10 | LED Luminaire |
| 18.0 | Security lighting along Boundary (As per scope of contract) | 10 | LED Luminaire |
| 19.0 | Gate complex/ Time office | 150 | LED Luminaire |

- Note :
- 1) In false ceiling area LED luminaire shall be recessed mounting type and in non-false ceiling area LED luminaire shall be of surface mounting type.
 - 2) For DC lighting & Hazardous areas LED type luminaries shall be used.
 - 3) 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 | Y | Y | Y | Y* | Y | Y | - |
| 02 | Boiler platforms & boiler area | Y | Y | Y | | Y | Y | - |
| 03 | ESP platforms & Mill area | Y | Y | - | - | Y | Y | - |
| 04 | ID, FD & PA FAN area | Y | Y | - | - | Y | - | - |
| 05 | Transformer Yard | Y | - | - | - | - | Y | - |
| 06 | ESP control room | Y | Y | Y (Refer Note-1) | Y* | - | Y | - |
| 07 | DG room | Y | Y | Y | - | Y | Y | - |
| 08 | Compressor house | Y | - | - | Y* | - | Y | Y |
| 09 | Fuel oil area | Y | - | - | Y* | Y | - | Y |
| 10 | Service building | Y | - | - | Y* | - | - | Y |
| 11 | FGD AREA (Other than FGD Control room) | Y | - | - | Y* | Y | Y | Y |
| 12 | FGD control room | Y | Y (Refer Note-2) | Y (Refer Note-2) | Y* | - | Y | - |
| NOTE - 1 | DC Lighting (DCE) shall be provided only at selected strategic locations in ESP Control room only . | | | | | | | |
| NOTE - 2 | AC Emergency Lighting (ACE) and DC Lighting (DCE) shall be provided only at selected strategic locations in FGD Control room only . | | | | | | | |

| | | |
|----------------|------|---|
| LEGEND: | ACN: | AC Normal Lighting |
| | ACE: | AC Emergency Lighting |
| | DCE: | DC Emergency Lighting |
| | Y: | YES |
| | Y*: | YES, Only in control room, offices & toilets |
| | \$: | Emergency Lighting Unit (ELU) & 5/15A Switch socket for ELU |



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TENTATIVE LOCATION OF LIGHTING DISTRIBUTION BOARDS

| S.No. | Location | Type | Rating | Description |
|-------|-------------------------------|------|---------|-------------|
| 1. | MV Switchgear Room | ACN | 100 KVA | 1UA |
| 2. | MV Switchgear Room | ACN | 100 KVA | 1UB |
| 3. | MV Switchgear Room | ACN | 100 KVA | 1UC |
| 4. | LV Switchgear Room | ACE | 100 KVA | 1UJ |
| 5. | LV Switchgear Room | DCE | 125 A | 1UM |
| 6. | LV Switchgear Room | ACN | 100 KVA | 1UD |
| 7. | LV Switchgear Room | ACN | 100 KVA | 1UE |
| 8. | Boiler MCC Room | ACN | 100 KVA | 1UF |
| 9. | Boiler MCC Room | ACE | 100 KVA | 1UK |
| 10. | Boiler MCC Room | DCE | 125 A | 1UN |
| 11. | ESP Switchgear Room | ACN | 100 KVA | 1UG |
| 12. | ESP Switchgear Room | ACN | 100 KVA | 1UH |
| 13. | ESP Switchgear Room | ACE | 50 KVA | 1UL |
| 14. | ESP Switchgear Room | DCE | 125 A | 1UO |
| 15. | Service Building | ACN | 100 KVA | 0UA |
| 16. | AC PLANT ROOM | ACN | 100 KVA | 0UB |
| 17. | Fuel Oil Unloading Pump House | ACN | 50 KVA | 0UC |
| 18. | Raw Water Pump House | ACN | 100 KVA | 0UD |
| 19. | Clarified Water Pump House | ACN | 100 KVA | 0UE |
| 20. | CW Pump House | ACN | 100 KVA | 0UF |
| 21. | DM Plant | ACN | 100 KVA | 0UG |
| 22. | DM Plant | ACN | 50 KVA | 0UG |
| 23. | Abandoned Pump House | ACN | 50 KVA | 0UH |
| 24. | FGD CONTROL ROOM | ACN | 100 KVA | 0UI |
| 25. | FGD CONTROL ROOM | ACN | 100 KVA | 0UJ |
| 26. | Water treatment Area (Misc.) | ACN | 50 KVA | 0UK |

LEGEND:

ACN : AC Normal LDB , ACE : AC Emergency LDB, DCE : DC LDB
LDB : Lighting Distribution Board,

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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) | % | +5% to -5% |
| e) | Combined voltage & frequency variation (sum of absolutes permissible) | % | 10% |
| f) | System fault level & duration | kA, sec. | 50kA for 1 sec. |
| 1.3 | DC Supply | | |
| a) | Rated voltage | V | 220 |
| b) | Voltage variation (permissible) | % | +10% to -15% |
| c) | System fault level & 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 <input type="checkbox"/> No |
| b) | DC emergency | | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| c) | DC Normal | | <input type="checkbox"/> 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 | | IP55 |
| 4.3 | Flame proof luminaires | | |
| a) | Hazardous area classification | | IS-2148 Zone II Group-IIA & IIB |
| b) | Degree of protection | | IP55 |



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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 | | Not Applicable |
| 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 (If applicable) | | <input checked="" type="checkbox"/> Cool Daylight <input checked="" type="checkbox"/> White Light |
| 4.6 | Emergency Lighting Unit | | |
| a) | Lamp type | | <input type="checkbox"/> FLT <input checked="" 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 / Lead-Acid |
| f) | AH capacity of battery | AH | To furnished by Vendor |
| g) | Battery voltage | V | 9V |
| h) | Battery backup time | Hr | 4 |
| i) | In built charger | | Yes |
| 4.7 | Exit Sign | | |
| a) | Lamp type | | FLT / CFL/ 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 / Lead-Acid |
| f) | AH capacity of battery | AH | To furnished by Vendor |
| g) | Battery voltage | V | To furnished by Vendor |



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| | | | |
|------------|--|------------------|--|
| h) | Battery backup time | Hr | 2.5 |
| 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 <input type="checkbox"/> No |
| b) | Surface treatment | | <input type="checkbox"/> 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 <input type="checkbox"/> LED |
| | Lamp wattage | W | 40 |
| f) | No. of outgoing sockets | | 4 |
| g) | Whether cord coiling arrangement provided | | <input checked="" type="checkbox"/> Yes air cooled <input type="checkbox"/> No |
| 5.0 | Junction Box | | |
| a) | Enclosure material | | CRCA/ Steel |
| b) | Enclosure thickness | mm | 16 SWG |
| c) | Galvanized (applicable for CRCA sheet) | | Yes |
| d) | Degree of protection | | IP-55 (indoor) / Weather proof IPW-55 with canopy for outdoor area & Flameproof for hazardous area |
| 6.0 | Industrial/ Welding Receptacle | | |
| a) | Enclosure material | | CRCA sheet steel |
| b) | Enclosure thickness | mm | 2 |
| c) | Surface treatment | | <input type="checkbox"/> Painted <input checked="" type="checkbox"/> Galvanized |
| d) | If galvanized | | |
| | Process | | Hot dip |
| | Weight of zinc | g/m ² | 460 gm / mm ² (65 microns) |

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| | | | |
|-------------|---|------------------|---|
| e) | Degree of protection | | IP-42 / IP 62(dusty area) |
| 7.0 | Decorative Receptacle | | |
| a) | Enclosure material | | MS Sheet |
| b) | Enclosure thickness | mm | 1 mm for MS sheet |
| c) | Surface treatment | | Galvanized/ Electro-plated |
| d) | If galvanized | | |
| | Process | | Hot dip |
| | Weight of zinc | g/m ² | 460 gm / mm ² (65 microns) |
| e) | Degree of protection | | IP-42 / IP 62(dusty area) |
| 8.0 | Switch Box | | |
| a) | Enclosure material | | [] FRP [✓] CRCA Sheet. |
| b) | Enclosure thickness | | 14 SWG MS sheet with 6mm thick Bakelite cover with brass fixing screws |
| c) | Galvanized | | [✓] Yes [] No |
| d) | Painted | | [] Yes [✓] 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 |
| 10.0 | Cable Glands | | By vendor for all incoming and outgoing cables |
| a) | Type | | Double compression |
| b) | Material | | Brass |
| c) | Nickel Plating provided | | [✓] Yes [] No |
| d) | Flameproof glands with flameproof equipment | | [✓] Yes [] No |
| 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 |


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| | | | |
|---|---|--------------------------------------|----------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | VOLUME II | |
| | | SECTION - I | |
| | 1 X 660MW BHUSAWAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 |
| | | SHEET 5 OF 5 | |

| | | | |
|----|--------------------|--|---|
| d) | Surface treatment | | <input checked="" type="checkbox"/> Galvanised <input type="checkbox"/> Painted |
| e) | Reference Standard | | IS: 4571, 3696 |

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).

| | | | | |
|---|---|--------------|--------------------------------------|--|
| 21895/2021/PS-PEM-EL | | | | |
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | | VOLUME II | |
| | | | SECTION - I | |
| | 1 X 660MW BHUSAVAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 | |
| | | SHEET 1 OF 4 | | |

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 |

| | | | | |
|---|---|--|---|-----------------------|
| 21895/2021/PS-PEM-EL | | | | |
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | | VOLUME II | |
| | | | SECTION - I | |
| | 1 X 660MW BHUSAVAL TPS UNIT-6 | | REVISION 0 | DATE: 10.06.21 |
| | | | SHEET 2 OF 4 | |


| | |
|---|---------|
| 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 |

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|---|---|--------------------------------------|----------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | VOLUME II | |
| | | SECTION - I | |
| | 1 X 660MW BHUSAWAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 |
| | | SHEET 3 OF 4 | |

LED LUMINAIRES

| | |
|-----------------------------|--|
| 16101:2012 | General Lighting. LEDs and LED modules Terms and definitions |
| 16102(Part 1):2012 | Self Ballasted LED Lamps for General Lighting Services. Part-1 Safety Requirements. |
| 16102(Part 2):2012 | Self Ballasted LED Lamps for General Lighting Services. Part-2 Performance Requirements. |
| 16103(Part I):2012 | LED modules for General Lighting Safety Requirements. |
| 15885(Part 2/Sec. 13) :2012 | Lamp control gear Part 2 particular Requirements Section 13 d.c. or a.c. Supplied Electronic control gear for LED modules d.c. or a.c. Supplied Electronic control gear for LED modules - Performance Requirements. |
| 16104:2012 | |
| 16105:2012 | Method of Measurement of Lumen maintenance of Solid-state Light (LED) Sources. |
| 16106:2012 | Method of Electrical and photometric Measurements of Solid State Lighting (LED) Products |
| 16107:2012 | Luminaires Performance |
| 16108:2012 | Photo-biological safety of Lamps and Lamp Systems |
| IS 513 | Cold rolled low carbon steel sheets and strips |
| IS 12063 | Classification of degree of protection provided by enclosures. |
| IS 14700 | Electro magnetic compatibility (EMC) – Limits (Part 3/Sec. 2) for Harmonic current emission – THD < 15% (equipment, Input current < 16 Amps. per phase. |
| IS 9000 (Part 6) | Environment testing: Test Z – AD: composite temperature/humidity cyclic test. |
| IS 15885 | Lamp control gear: particular requirements for (Part 2/Sec. 13) DC or AC supplied electronic control gear IS 16004 – 1 and 2) for LED modules. |
| IS 4905 | Method for random sampling |

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|---|---|--------------------------------------|----------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | VOLUME II | |
| | | SECTION - I | |
| | 1 X 660MW BHUSAVAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 |
| | | SHEET 4 OF 4 | |

Electrical Installation Practices & Miscellaneous

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

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| 1895/2021/PS-PEM-EL | | | | |
| | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | | VOLUME II | |
| | | | SECTION - I | |
| | 1 X 660MW BHUSAWAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 | |
| | | SHEET 1 OF 1 | | |

DATA SHEET-B

(Bidder to fill details of luminaires as per parameters mentioned below and furnish Data Sheet - B along with technical offer)

| SL. NO. | DESCRIPTION | LUMINAIRE MAKE AND MODEL | MEASURED ELECTRICAL INPUT POWER (W) MAX. VALUE | TOTAL LUMINOUS FLUX (LUMEN) OF LUMINAIRE - MIN. VALUE |
|---------|--|--------------------------|--|---|
| | MAIN SUPPLY ITEMS | | | |
| 1.0 | Lighting Luminaires (complete with accessories) | | | |
| 1.01 | Luminaire Type FC06 (LED) | | | |
| 1.02 | Luminaire Type FC07 (LED)-DC | | | |
| 1.03 | Luminaire Type FC33 (LED)-DC | | | |
| 1.04 | Luminaire Type FC34 (LED)-DC | | | |
| 1.05 | Luminaire Type FC26 (LED) | | | |
| 1.06 | Luminaire Type FC30 (LED) | | | |
| 1.07 | Luminaire Type FC32 (LED) | | | |
| 1.08 | Luminaire Type FC81 (LED) | | | |
| 1.09 | Luminaire Type SB11 (LED) | | | |
| 1.1 | Luminaire Type SB02 (LED) | | | |
| 1.11 | Luminaire Type SB03 (LED) | | | |
| 1.12 | Luminaire Type SF63 (LED) | | | |
| 1.13 | Luminaire Type SF64 (LED) | | | |
| 1.14 | Luminaire Type SF66 (LED) | | | |
| 1.15 | Luminaire Type SS62 (LED) | | | |
| 1.16 | Luminaire Type SS63 (LED) | | | |
| 1.17 | Luminaire Type SW41 (LED) | | | |
| 1.18 | Luminaire Type SW42 (LED) | | | |
| 1.19 | Luminaire Type MW96 (LED) | | | |
| 1.20 | Down lighter (LED) | | | |
| 1.21 | Cove Light (LED) | | | |

ANNEXURE-A
SUB-VENDOR LIST

| 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.bhadoria@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.bhadoria@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.bhadoria@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.bhadoria@siemens.com | |
| ES5 | 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 | |
| | 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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|---------------------------|--------|-------------|--|--|--|-------------------------|
| | ACDB/ DCDB FIXED TYPE | 12 | E1043 | ECS PRIVATE LTD | 7/47, Site 2, Upside 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.bhadoria@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 INDLAREA,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, | 0124-2842000, 9873424331 amit.bhadoria@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, BIDC, 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.bhadoria@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.bhadoria@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@electromacglands.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 | |
| ES11 | CABLE GLANDS | 1 | E1201 | ALLIED TRADERS & EXPORTERS | C-124 A, SECTOR-2, NOIDA -201 301, UTTAR PRADESH, INDIA | Mr. Vijay Mohan Sood +(91)-(120)-2525694 +(91)-(120)-3052594 +(91)-(11)-23287156 vijay_mohansood@yahoo.com | |
| | CABLE GLANDS | 2 | E1017 | ARUP ENGG & FOUNDARY WORKS | 391/119,PRINCE ANWAR SHAH ROAD, CALCUTTA-700068 | 033 2473 0850 | |
| | CABLE GLANDS | 3 | E1206 | BALIGA LIGHTING EQPT.PVT.LTD. | 63A,CP RAMASWAMY ROAD, ALWARPET,P.B.No 6910, CHENNAI-600018 | 44-24995505,22680990-4 | |
| | CABLE GLANDS | 4 | E1036 | COMMET BRASS PRODUCTS | NUTAN CHEMICAL COMPOUND, WALBHAT ROAD, GOREGAON, MUMBAI-400063 | 91-022-26852961/62/63 comet@vsnl.net | |
| | CABLE GLANDS | 5 | DW08 | DOWELLS | M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063. | CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/ 022-29270878. | |
| | CABLE GLANDS | 6 | E1044 | ELECTROMAC INDUSTRIES | 27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059 | 91-22-28324829 / 66919034 devang@electromacglands.com | |
| | CABLE GLANDS | 7 | I01 | INCAB | HARE STREET,KOLKATA, WEST BENGAL-700001 | 91-33-2480161/62/63/64 Fax : 91-33-2485766 | |
| | 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/ | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|--|--------|-------------|--|---|--|-------------------------|
| ES12 | 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, | 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.bhadoria@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.bhadoria@siemens.com | |
| | EARTH LEAKAGE CB | 3 | A35 | GE-POWER | KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032 | 044-49681447 | |
| | EARTH LEAKAGE CB | 4 | S03 | SCHNEIDER ELECTRIC INDIA PVT. LTD. | 9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002 | 0124-3940400 | |
| | EARTH LEAKAGE CB | 5 | C01 | C&S ELECTRIC LTD. | 222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020 | 011-3088 7520-29 | |
| | EARTH LEAKAGE CB | 6 | A24 | ABB | 14, MATHURA ROAD, FARIDABAD, HARYANA-121003 | 0129-2567580, 09871799449 | |
| | EARTH LEAKAGE CB | 7 | E1068 | INDO ASIAN | B-24, PHASE - II , NOIDA - 201305, U.P. | 120-3042222 | |
| | EARTH LEAKAGE CB | 8 | E1088 | MDS SWITCHGEAR LTD | 314-317SHAH NAHAR ESTATE | 011 - 25793021 | |
| | EARTH LEAKAGE CB | 9 | E1120 | S&S POWER SWITCHGEAR LTD, | NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004 | 044 - 24988056, 044 - 24988057, 044 - 24988058 | |
| 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.bhadoria@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 |
| | 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 | |
| | 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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|--|--------|-------------|----------------------------------|---|---|------------------------------------|
| ES22 | 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, II 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 COMPUND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMIBIKA TEMPLE, MUMBAI Mumbai - 400086, Maharashtra, India | 91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR) | |
| | LT- CURRENT TRANSFORMER | 9 | CO1 | C&S ELECTRIC LTD. | 222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020 | 011-3088 7520-29 | |
| | 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 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- 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. AMIBIKA TEMPLE, MUMBAI Mumbai - 400086, Maharashtra, India | 91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR) | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|---------------------------|--------|-------------|------------------------------------|---|--|---------|
| | 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.bhadoria@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 : srbans@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 : srbans@bajajelectricals.com; | |
| ES28 | FUSE BASE | 1 | E1068 | INDO ASIAN | B-24, PHASE - II , NOIDA - 201305, U.P. | 120-3042222 | |
| | FUSE BASE | 2 | G01 | GE-POWER | KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032 | 044-49681447 | |
| | FUSE BASE | 3 | L01 | L&T | 32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015 | 011-41419554/59 | |
| | FUSE BASE | 4 | C01 | C&S ELECTRIC LTD. | 222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020 | 011-3088 7520-29 | |
| | FUSE BASE | 5 | S01 | SIEMENS | RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA | 0124-2842000, 9873424331 ;amit.bhadoria@siemens.com | |
| | FUSE BASE | 6 | A24 | ABB | 14, MATHURA ROAD, FARIDABAD, HARYANA-121003 | 0129-2567580, 09871799449 | |
| | FUSE BASE | 7 | S02 | SPACEAGE SWITCHGEARS LTD. | 68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001 | 0124-2302711, 4085091 | |
| | FUSE BASE | 8 | S03 | SCHNEIDER ELECTRIC INDIA PVT. LTD. | 9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002 | 0124-3940400 | |
| | FUSE BASE | 9 | G01 | ALSTOM LTD | A-7, SEC-65, NOIDA | 0120-479 0000 | |
| | FUSE BASE | 10 | E1050 | ESSEN DEINKI | FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI | 011-26217060 | |
| ES29 | HRC FUSES | 1 | E1068 | INDO ASIAN | B-24, PHASE - II , NOIDA - 201305, U.P. | 120-3042222 | |
| | HRC FUSES | 2 | G01 | GE-POWER | KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032 | 044-49681447 | |
| | HRC FUSES | 3 | L01 | L&T | 32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015 | 011-41419554/59 | |
| | HRC FUSES | 4 | C01 | C&S ELECTRIC LTD. | 222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020 | 011-3088 7520-29 | |
| | HRC FUSES | 5 | S01 | SIEMENS | RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA | 0124-2842000, 9873424331 ;amit.bhadoria@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 | |
| | 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, Howarah -711403 | 28756318/28741986/28725402/28725765 | |
| | GALVANISING | 6 | | Steel Products | National Highway No. 6, Chamrail, Kona, Howrah-711114 | | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|--------------------------|--------|-------------|--|--|---------------------|---------|
| ES30 | 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 | | |
| | 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 | | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|-------------------------------------|--------|-------------|--|--|---|--|
| | GI WIRE & FLAT | 11 | S210 | SARAL INDUSTRIES | Mr. Y.K. Gupta L-1, L-2, Industrial Area-1 Sultanpur Road Rae Bareilly-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 | |
| | IND.POWER & WLDG SOCKETS | 3 | B04 | BCH | 20/4, MATHURA ROAD, FARIDABAD - 121006, HARYANA, INDIA | 0(129)-4063000, 9015800189(Ramesh Giri) 'ramesh.giri@bchindia.com | |
| | IND.POWER & WLDG SOCKETS | 4 | B02 | BEST & CROMPTON | Best & Crompton Engineering Ltd 28C, Ambattur Industrial Estate (North) Ambattur, Chennai - 600 098 | Ph : +91 44 4551 4724 , MRKT DGM Mr. VI Raji:- 9840593411 'bestcromptonviraj@gmail.com | BEST & CROMPTON ENGINEERING LTD 28C, AMBATTUR INDUSTRIAL ESTATE (NORTH) AMBATTUR, CHENNAI - 600 098 |
| | IND.POWER & WLDG SOCKETS | 5 | A03 | AJMER INDUSTRIES & ENGG. WORKS | AJMER INDL AND ENGG. WORKS. AJMER 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, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM | Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214 | |
| | INTERPOSING RELAY | 4 | E1099 | OEN INDIA LTD | 29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA | Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com | |
| | INTERPOSING RELAY | 5 | S01 | SIEMENS | RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA | 0124-2842000, 9873424331 amit.bhadoria@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.bhadoria@siemens.com | |
| | INDICATING LAMPS | 7 | S03 | SCHNEIDER ELECTRIC INDIA PVT. LTD. | 9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002 | 0124-3940400 | |
| | JUNCTION BOXES (NON FLAME PROOF) | 1 | J01 | JASPER ENGINEERS PVT. LTD. | A-23, SECTOR - 8, NOIDA-201301 | 0120-4033520/533 | |
| | JUNCTION BOXES (NON FLAME PROOF) | 2 | EC05 | Electro Controls & Devices | M/S ELECTRO CONTROLS & DEVICES, F-41, SITE-C, 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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|----------------------------------|--------|-------------|---|---|--|-------------|
| ES36 | 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 | |
| | 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 | AJMER INDUSTRIES & ENGG. WORKS | AJMER INDL. AND ENGG. WORKS. AJMER HOUSE, A-61 / KHAIRANE MIDC. , TTC INDL. AREA, NAVI MUMBAI – 400705. | Tel : 022 27620299 / 97 / 96 'mail@ajmera.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. | Esquire 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 971772245 · 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@sudhirswhitchgears.com ; works@sudhirswhitchgears.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@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230 74373 ; Email: asgar@mikaengineers.com | |
| | LIGHTING DISTRIBUTION BOARDS | 4 | F04 | ELEXPRO ELECTRICALS PVT/ LTD. | C 1/27 & 37 GIDC KABILPORE NAVSARI-396424 | 02637-265140, Mr. Jssk kumar | |
| | LIGHTING DISTRIBUTION BOARDS | 5 | KM1 | KMG ATOZ SYSTEMS | "ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA) | Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710 | |
| | LIGHTING DISTRIBUTION BOARDS | 6 | E05 | UNILEC ENGINEERS PVT. LTD. | BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001 | 0124-4030247,248, 4559700, 9911087173 | |
| | LIGHTING DISTRIBUTION BOARDS | 7 | AVA01 | AVAIODS TECHNOVATORS LTD. | PLOT NO.25 ,SECTOR-3,IMT-MANESAR, GURGEON-122050 (HARYANA) | KRISHNA KALRA- 09958096168 | |
| | LIGHTING DISTRIBUTION BOARDS | 8 | ACE01 | Adroit Control Engineers Pvt.Ltd. | M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL. AREA, SECTOR-25 FARIDABAD – 121004 | 011-47600700, 0129-4251400 | |
| | LIGHTING DISTRIBUTION BOARDS | 9 | JC01 | JACKSON 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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|------------------------------|--------|-------------|--|---|--|---------|
| 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 (psisodiya@pyrotechlighting.com) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309 | |
| | LIGHTING DISTRIBUTION BOARDS | 14 | PCS01 | Positronics Pvt. Ltd. | POSITRONICS HOUSE ,882/ 2, G.I.D.C. MAKARPURA,VADODARA 390010 GUJARAT | +91 265 2642496 Fax: +91 265 264 7033 / 234 0944 E- mail : info@positronicsindia.com Website:www.positronicsindia.com | |
| | LIGHTING DISTRIBUTION BOARDS | 15 | ISC01 | Industrial Switchgears & Control Pvt Ltd | S-02 AMARDEEP MAHAL, NANDA PATKAR RD, VILE PARLE EAST, MUMBAI - 400057 | (91)-22-26182011 | |
| | LIGHTING DISTRIBUTION BOARDS | 16 | VC01 | M/s Vidhyut Control (I) Pvt.Ltd. | D-12 & 13, SECTOR-17, KAVI NAGAR INDLAREA, 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 | ELEXPRO ELECTRICALS PVT/ LTD. | C 1/27 & 37 GIDC KABILPORE NAVSARI-396424 | 02637-265140, Mr. Jssk kumar | |
| | LIGHTING FIXTURES (NON LED) | 4 | B05 | BAJAJ ELECTRICALS | BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049 | CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srbans@bajajelectricals.com; | |
| | LIGHTING FIXTURES (NON LED) | 5 | C02 | CROMPTON GREAVES | 3RD FLOOR, EXPRESS BUILDING,9-10, BAHADUR SHAH ZAFAR MARG, NEAR ITO CROSSING,NEW DELHI-110002, INDIA | 91 11 23460700 - 999 Sunil.Das@cgglobal.com, Mr. Prashant Wewhare 9930095703 | |
| | LIGHTING FIXTURES (NON LED) | 6 | E1051 | EVERGREEN ENGG. CO. | EVERGREEN ENGG COMPANY WORKS-5, PLOT NO. 9,10,11,12, SURVEY NO. 242, CHINCH PADA, VASAI EAST-401208 | (0250) 6458250 | |
| | LIGHTING FIXTURES (NON LED) | 7 | P01 | PHILIPS | 9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002 | 01244606001, Sharad (+919871150447) | |
| | LIGHTING FIXTURES (NON LED) | 8 | WP01 | WIPRO LTD. | WIPRO CONSUMER CARE AND LIGHTING, 5TH FLOOR, GODREJ ETERNIA -C, OLD PUNE- MUMBAI ROAD, SHIVAJINAGAR, PUNE -411005 | 020-66098700 | |
| | LIGHTING FIXTURES (NON LED) | 9 | HP01 | M/S HPL ELECTRIC & POWER PVT. LTD | M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL AREA , KUNDLI, DIST.- SONEPAT (HARYANA) - 131028 | mohitsharma@hplindia.com' | |
| | LIGHTING FIXTURES (NON LED) | 10 | SR01 | SURYA ROSHNI LIMITED | PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI | 011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com | |
| | LIGHTING FIXTURES (NON LED) | 11 | HI02 | HAVELLS INDIA LIMITED | QRG TOWERS , 2D SECTOR-126, NOIDA- 201301 | GIRISH KUMAR SHRIVASTAVA +91-9810528922 | |
| | LIGHTING FIXTURES (NON LED) | 12 | HN13 | M/s Halonix Technologies Limited | M/s Halonix Technologies Limited B-31 , Phase –II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305 | Mr. Mohit Gautam ' 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; 'rahul.singh@halonix.co.in' | |
| | 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@neevenenergy.in, Jitendra Sahu <jsahu@neevenenergy.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 : srbans@bajajelectricals.com; | |
| | LIGHTING FIXTURES (LED) | 4 | SR01 | SURYA ROSHNI LIMITED | | 1 011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|----------------------------------|--------|-------------|--|---|--|---------|
| ES40 | LIGHTING FIXTURES (LED) | 5 | P01 | PHILIPS | 9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002 | 01244606001, Sharad (+919871150447), Mr. Guruseelan M 8939693949, Mr Ashish Sethi 9007077089 | |
| | LIGHTING FIXTURES (LED) | 6 | HP01 | M/S HPL ELECTRIC & POWER PVT. LTD | M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL AREA , KUNDLI, DIST:- SONEPAT (HARYANA) - 131028 | mohitsharma@hplindia.com, Mr. Nitesh Verma 8851036938, Mr Ajay lakra 9560045423 | |
| | LIGHTING FIXTURES (LED) | 7 | INS1 | INSTA POWER | PLOT NO. - 457 PHASE - V, UDYOG VIHAR, GURGAON - 122016 | 124-4124000, Mr amit Bhardwar: 8800508090 | |
| | LIGHTING FIXTURES (LED) | 8 | PT13 | Pyrotech Electronics Pvt. Ltd. | M/s Pyrotech Electronics Pvt. Ltd(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan, | Concern Person – Mr. Praveen sisodiya : 9314310042(psisodia@pyrotechlighting.com) Ms Ritika 9509245814 | |
| | LIGHTING FIXTURES (LED) | 9 | HN13 | M/s Halonix Technologies Limited | M/s Halonix Technologies Limited B-31 , Phase –II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305 | Mr. Mohit Gautam 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; M: 9891868793'rahul.singh@halonix.co.in' | |
| | 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 | |
| ES41 | 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 (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; | |
| ES42 | LIGHTING FIXTURES (FLAME PROOF) | 3 | E1206 | BALIGA ELECTRICALS | 63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018 | 44-24995505,22680990-4 | |
| | LIGHTING LAMP (NON LED) | 1 | WP01 | WIPRO LTD. | WIPRO CONSUMER CARE AND LIGHTING, 5TH FLOOR, GODREJ ETERNIA - C, OLD PUNE- | 020-66098700 | |
| | LIGHTING LAMP (NON LED) | 2 | E1050 | ESSEN DEINKI | FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI | 9818338922 | |
| | LIGHTING LAMP (NON LED) | 3 | B05 | BAJAJ ELECTRICALS | BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049 | CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com; | |
| | LIGHTING LAMP (NON LED) | 4 | INS1 | INSTA POWER | PLOT NO. - 457 PHASE - V, UDYOG VIHAR, GURGAON - 122016 | 124-4124000 | |
| | LIGHTING LAMP (NON LED) | 5 | P01 | PHILIPS | 9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE-III,GURGAON-122002 | 01244606001, Sharad (+919871150447) | |
| | LIGHTING LAMP (NON LED) | 6 | HI01 | HAVELLS INDIA LIMITED | QRG TOWERS , 2D SECTOR-126, NOIDA- 201301 | GIRISH KUMAR SHRIVASTAVA +91-9810528922 | |
| | LIGHTING LAMP (NON LED) | 7 | HP01 | HPL | M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL AREA , KUNDLI, DIST:- 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' | |
| | 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 | QRG TOWERS , 2D SECTOR-126, NOIDA- 201301 | GIRISH KUMAR SHRIVASTAVA +91-9810528922 | |
| | LIGHTING LAMP (LED) | 3 | B05 | BAJAJ ELECTRICALS | BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049 | CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com; | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|-------------------------------------|--------|-------------|-----------------------------------|--|---|---------|
| ES43 | 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 | |
| | 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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|---|--------|-------------|------------------------------------|---|---|---------|
| ES46 | 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 sanjeevkulkarni@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 ELEKTRIS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA. | PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com | |
| | LIGHTING TRANSFORMER | 7 | AIE01 | Ames Impex Electricals Pvt. Ltd | C-1B/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330 | Phone:079 2282 1648 | |
| 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 ENGINREES 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 | |
| | 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.bhadoria@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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|----------------------------------|--------|-------------|------------------------------------|---|---|---------------------|
| 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@sudhirschwitchgears.com ; works@sudhirschwitchgears.com ; scud@vsnl.com | |
| ES50 | LIGHTING PANEL (NON FLAME PROOF) | 1 | E1091 | MIKA ENGINEERS | D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054. | Director : Mr. Asgar Karimi E-mail : mika@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230 | |
| | LIGHTING PANEL (NON FLAME PROOF) | 2 | F04 | ELEXPRO ELECTRICALS PVT/ LTD. | C 1/27 & 37 GIDC KABILPORE NAVSARI-396424 | 02637-265140, Mr. Jssk kumar | |
| | LIGHTING PANEL (NON FLAME PROOF) | 3 | VC01 | Vidhyut Controls (India) Pvt. Ltd. | M/S VIDHYUT CONTROL (I) PVT.LTD. D-12 & 13, SECTOR-17,KAVI NAGAR INDL AREA,GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA | 0120-4186400, 0120-4186423, 8527005590(DK GUPTA) | |
| | LIGHTING PANEL (NON FLAME PROOF) | 4 | KM1 | KMG ATOZ SYSTEMS | "ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA) | Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710 | |
| | LIGHTING PANEL (NON FLAME PROOF) | 5 | E05 | UNILEC ENGINEERS PVT. LTD. | BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001 | 0124-4030247,248, 4559700, 9911087173 | |
| | LIGHTING PANEL (NON FLAME PROOF) | 6 | AVA01 | AVAIODS TECHNOVATORS LTD. | PLOT NO.25 ,SECTOR-3,IMT-MANESAR, GURGEON-122050 (HARYANA) | KRISHNA KALRA- 09958096168 | |
| | LIGHTING PANEL (NON FLAME PROOF) | 7 | ACE01 | Adroit Control Engineers Pvt.Ltd. | M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL. AREA, SECTOR-25 FARIDABAD – 121004 | 011-47600700, 0129-4251400 | |
| | 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 | |
| ES51 | MCB | 1 | E1088 | MDS SWITCHGEAR LTD | 314-317SHAH NAHAR ESTATE | 011 - 25793021 | |
| | MCB | 2 | E1068 | INDO ASIAN | B-24, PHASE - II , NOIDA - 201305, U.P. | 120-3042222 | |
| | MCB | 3 | S03 | SCHNEIDER ELECTRIC INDIA PVT. LTD. | 9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002 | 0124-3940400 | |
| | MCB | 4 | E1120 | S&S POWER SWITCHGEAR LTD. | NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004 | 044 - 24988056, 044 - 24988057, 044 - 24988058 | |
| ES52 | MCC (FIXED TYPE) | 1 | S02 | SPACEAGE SWITCHGEARS LTD. | 68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001 | 0124-2302711, 4085091 | |
| | 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 | |
| ES53 | 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 , MALLSWARAM 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 | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|---------------------------------|--------|-------------|---|---|---|---------|
| | 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 | |
| ES54 | 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 | |
| ES55 | MODULAR SWITCH BOARD | 1 | E1012 | ANCHOR | STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA - 400093 | 022-30418888. | |
| | MODULAR SWITCH BOARD | 2 | F04 | ELEXPRO ELECTRICALS PVT/ LTD. | C 1/27 & 37 GIDC KABILPORE NAVSARI-396424 | 02637-265140, Mr. Jssk kumar | |
| | MODULAR SWITCH BOARD | 3 | HI01 | HAVELLS INDIA LIMITED | QRG TOWERS , 2D SECTOR-126, NOIDA- 201301 | GIRISH KUMAR SHRIVASTAVA +91-9810528922 | |
| ES56 | 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 | |
| ES57 | 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 | |
| ES58 | 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 | |
| ES59 | RECEPTACLES - DECORATIVE | 1 | E1012 | ANCHOR | STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA - 400093 | 022-30418888. | |
| | RECEPTACLES - DECORATIVE | 2 | F04 | ELEXPRO ELECTRICALS PVT/ LTD. | C 1/27 & 37 GIDC KABILPORE NAVSARI-396424 | 02637-265140, Mr. Jssk kumar | |
| | RECEPTACLES - DECORATIVE | 3 | B05 | BAJAJ ELECTRICALS | BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI - 110049 | CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srbans@bajajelectricals.com; | |
| | RECEPTACLES - DECORATIVE | 4 | A03 | AJMER INDUSTRIES & ENGG. WORKS | AJMER IND. AND ENGG. WORKS. AJMER HOUSE, A-61 / KHAIRANE MIDC., TTC IND. AREA, NAVI MUMBAI - 400705. | Tel : 022 27620299 / 97 / 96 mail@ajmera.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 | ELEXPRO ELECTRICALS PVT/ LTD. | C 1/27 & 37 GIDC KABILPORE NAVSARI-396424 | 02637-265140, Mr. Jssk kumar | |
| | SWITCH BOX | 3 | B05 | BAJAJ ELECTRICALS | BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI - 110049 | CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srbans@bajajelectricals.com; | |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|---|--------|-------------|--|---|--|-------------------------|
| | SWITCH BOX | 4 | A03 | AJMERIA INDUSTRIES & ENGG. WORKS | AJMERIA INDL. AND ENGG. WORKS. AJMERIA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI – 400705. | Tel : 022 27620299 / 97 / 96 'mail@ajmeria.net | |
| | SWITCH BOX | 5 | SB02 | S.B. ELECTRICAL ENGINEERING CORPORATION | 03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002 | 022- 22069831; 022-66637259 | |
| ES62 | TERMINAL BLOCKS | 1 | CO1 | 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 | |
| | 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 | AJMERIA INDUSTRIES & ENGG. WORKS | AJMERIA INDL. AND ENGG. WORKS. AJMERIA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL. AREA, NAVI MUMBAI – 400705. | Tel : 022 27620299 / 97 / 96 'mail@ajmeria.net | |
| | RECEPTACLE (NON FLAME PROOF) | 2 | 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@cggglobal.com | |
| | RECEPTACLE (NON FLAME PROOF) | 3 | 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 | |
| | 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 Raji:- 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 | |


ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|---|--------|-------------|--|---|---|-------------------------|
| | EMERGENCY LIGHTING UNIT (FIXED & PORTABLE TYPE)- NON FLAME PROOF | 2 | PEP05 | PROLITE AUTOGL0 LIMITED, | PROLITE AUTOGL0 LTD 25 SINGH INDUSTRIAL ESTATE NO. 3, RAM MANDIR ROAD., GOREGAON (W), MUMBAI, MAHARASHTRA 400104, INDIA | 022-67868100 sales@prolite.com | |
| ES70 | EMERGENCY LIGHTING UNIT (FIXED & PORTABLE TYPE)- FLAME PROOF | 1 | | | | | |
| ES71 | 24V SUPPLY MODULE WITH COMPLETE ACCESSORIES | 1 | E1103 | POWER PACK ENTERPRISES | POWER PACK ENTERPRISES MR. NEHAL SHAH / MR. SHARAD SHAH (PARTNER) NO. 3, JAYSHREE SADAN, 1ST FLOOR, OLD NAGARDAS ROAD, ANDHERI EAST MUMBAI - 400069, MAHARASHTRA, INDIA | Call Us:08447573761 Mobile: +(91)-9821787821 +(91)-9821035604 | |
| | 24V SUPPLY MODULE WITH COMPLETE ACCESSORIES | 2 | E1066 | INDCOIL | ADDRESS: PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070 | Phone:022 2583 8305 | |
| | 24V SUPPLY MODULE WITH COMPLETE ACCESSORIES | 3 | AIE01 | Ames Impex Electricals Pvt. Ltd | C-1B/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330 | Phone:079 2282 1648 | |
| 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 | |
| | 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 | |
| | 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 |

ANNEXURE-A
SUB-VENDOR LIST

| ITEM CODE | ITEM/SERVICE DESCRIPTION | SL NO. | VENDOR CODE | VENDOR NAME | ADDRESS | PHONE | REMARKS |
|-----------|--|--------|-------------|---|---|--|---------|
| ES78 | 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 | | |
| 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: srabans@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 | 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 | |
| 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, Uttarakhand-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) | |


321895/2021/PS-PEM-EL

| | | | |
|---|---|--------------------------------------|----------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | VOLUME II | |
| | | SECTION - I | |
| | 1 X 660MW BHUSAWAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 |
| | | SHEET 1 OF 1 | |

ANNEXURE-B

DOCUMENTS REQUIRED AFTER AWARD OF LOI/PO

- Schedule of drawing/ document to be submitted is part of NIT -

| | | | |
|---|---|--------------------------------------|----------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | VOLUME II | |
| | | SECTION - I | |
| | 1 X 660MW BHUSAWAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 |
| | | SHEET 1 OF 1 | |

ANNEXURE-C


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.

321895/2021/PS-PEM-EL

| | | | |
|---|---|--------------------------------------|----------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | SPECIFICATION NO. PE-TS-415-558-E001 | |
| | | VOLUME II | |
| | | SECTION - I | |
| | 1 X 660MW BHUSAWAL TPS UNIT-6 | REVISION 0 | DATE: 10.06.21 |
| | | SHEET 1 OF 1 | |

ANNEXURE-D

SCOPE MATRIX FOR BROAD ACTIVITIES

| 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.

321895/2021/PS-PEM-EL



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

SPECIFICATION NO. PE-SS-999-558-E006

VOLUME II

SECTION II

REVISION: 0

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



TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS

SPECIFICATION NO. PE-SS-999-558-E006

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| 2.0 | CODES & STANDARDS |
| 3.0 | LIGHTING SYSTEM DESCRIPTION (CONCEPTUAL VIEW) |
| 4.0 | SYSTEM DESIGN ENGINEERING |
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| 4.2 | DESIGN CRITERIA |
| 4.3 | ENGINEERING OUTPUTS |
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| 5.15 | CABLE GLANDS |
| 5.16 | CABLE LUGS |
| 5.17 | FLEXIBLE METALLIC CONDUITS AND FITTINGS |
| 5.18 | PVC CONDUITS |
| 6.0 | SURFACE TREATMENT |
| 7.0 | PACKING |
| 8.0 | GUARANTEED PERFORMANCE REQUIREMENTS |
| 9.0 | INSPECTION & TESTING |
| 10.0 | SPARES |
| 11.0 | TOOLS & TACKLES |
| 12.0 | DOCUMENTATION |
| | ANNEXURE-I: LUMINAIRE DETAILS |



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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, annunciations 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:

- 1 LED Luminaires shall be used for the lighting if specified in BOQ as part of NIT.
- 2 In false ceiling area LED luminaires shall be recessed mounting type & in non-false ceiling area the LED luminaires shall be surface mounting type.
- 3 The individual lamp wattage for LED shall be upto 3 watt.
- 4 The LED chip efficacy shall be min 120 Lm/W. The luminaire efficacy shall be not less than 70Lm/W.
- 5 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.
- 6 The LED luminaire shall have minimum life of 25,000 burning hours with 80% of lumen maintenance at the end of the life.
- 7 The beam angle for LED chip shall be 120 degrees.
- 8 The max. junction temperature of LED shall be 85 deg C, further the lumen maintenance at this temperature shall be min 90%.
- 9 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.
- 10 The marking on luminaire & safety requirements of luminaire shall be as per IS standards.
- 11 Suitable heat sink with proper thermal management shall be designed & provided in the luminaire.
- 12 The connecting wires used inside the system, shall be low smoke halogen free, fire retardant PTFE cable.
- 13 Fuse protection shall be provided in input side specifically for LED luminaires.
- 14 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.
- 15 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-E001**) 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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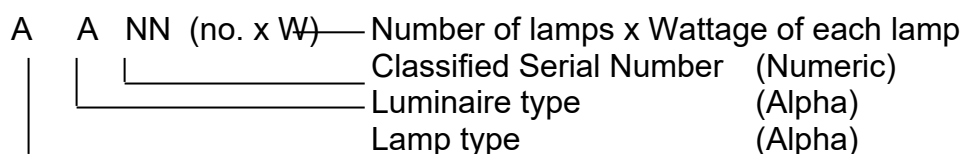
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ANNEXURE-I

LUMINAIRE DETAILS

LUMINAIRE CODING SCHEME

1.0 Code Structure



2.0 Lamp types

- | | | | |
|----|---|---|----------------|
| a) | F | - | Fluorescent |
| b) | M | - | Mercury Vapour |
| c) | S | - | Sodium Vapour |
| d) | T | - | Tungsten |
| e) | H | - | Halogen |

3.0 Luminaire types

- | | | | |
|----|---|---|-------------------------------|
| a) | C | - | Channel Mounted (Fluorescent) |
| b) | B | - | Bay Mounted |
| c) | W | - | Well Glass |
| d) | S | - | Street Lighting |
| e) | F | - | Flood Lighting |
| f) | H | - | Bulk Head |
| g) | P | - | Post Top Lantern |
| h) | E | - | Emergency Lighting |
| i) | X | - | Others |

4.0 Serial Numbers

- | | | |
|----|---------|------------------------------|
| a) | 01 - 20 | General Purpose (Industrial) |
| b) | 21 - 40 | Decorative |
| c) | 41 - 50 | Vapour Proof |
| d) | 51 - 60 | Dust Proof |
| e) | 61 - 70 | Drip Proof |
| f) | 81 - 90 | Corrosion Proof |
| g) | 91 - 99 | Flame Proof |

NOTES :

1. Flood lighting luminaires to have non-integral control gearbox.
2. All other luminaires shall have integral control gearbox, unless specifically mentioned otherwise in enclosed sheets.
3. For more details of each luminaire, refer specification.



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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.



TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS

SPECIFICATION NO. PE-SS-999-558-E006

VOLUME II


SECTION II

REVISION: 0

DATE: 08.09.2016

SHEET 36 OF 38

| | | | |
|------|------|---------|---|
| 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. |

| | | | | |
|---|---|--|--------------------------------------|------------------|
|  | TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS | | SPECIFICATION NO. PE-SS-999-558-E006 | |
| | | | VOLUME II | |
| | | | SECTION II | |
| | | | REVISION: 0 | DATE: 08.09.2016 |
| | | | SHEET | 37 OF 38 |

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. |

321895/2021/PS-PEM-EL



TECHNICAL SPECIFICATION FOR LIGHTING FIXTURES, LAMPS & MISCELLANEOUS ITEMS

SPECIFICATION NO. PE-SS-999-558-E006

VOLUME II

SECTION II

REVISION: 0

DATE: 08.09.2016

SHEET 38 OF 38

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

5.0 Halogen

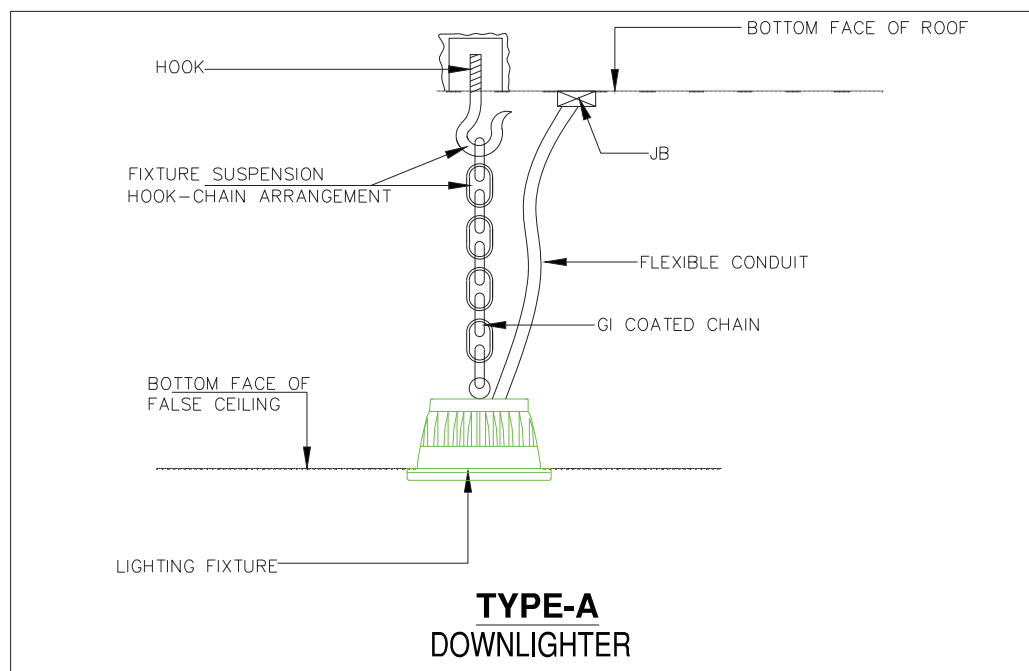
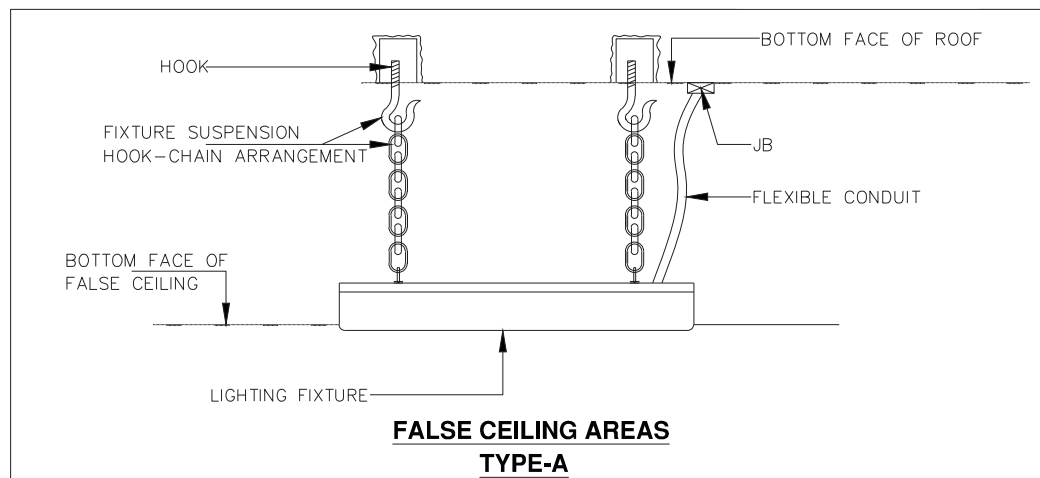
5.1 HF61 1 x 300 Halogen, flood light, drip proof.

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

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

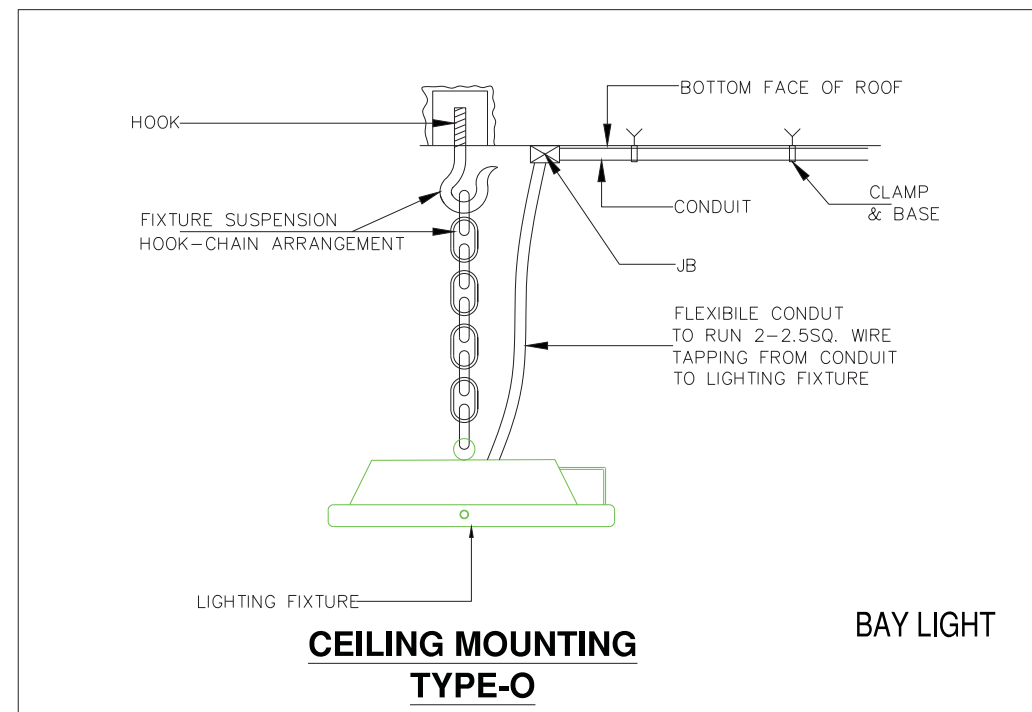
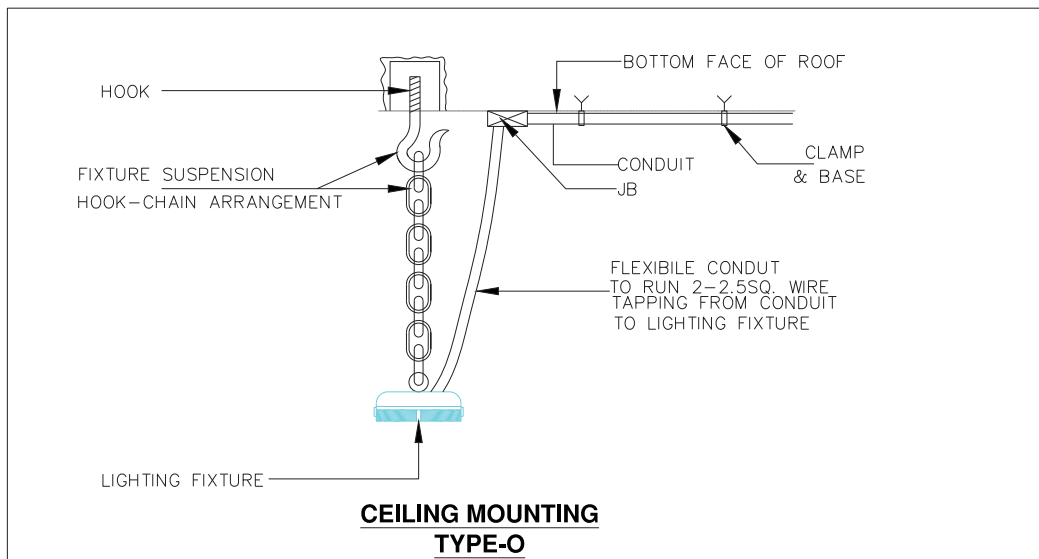
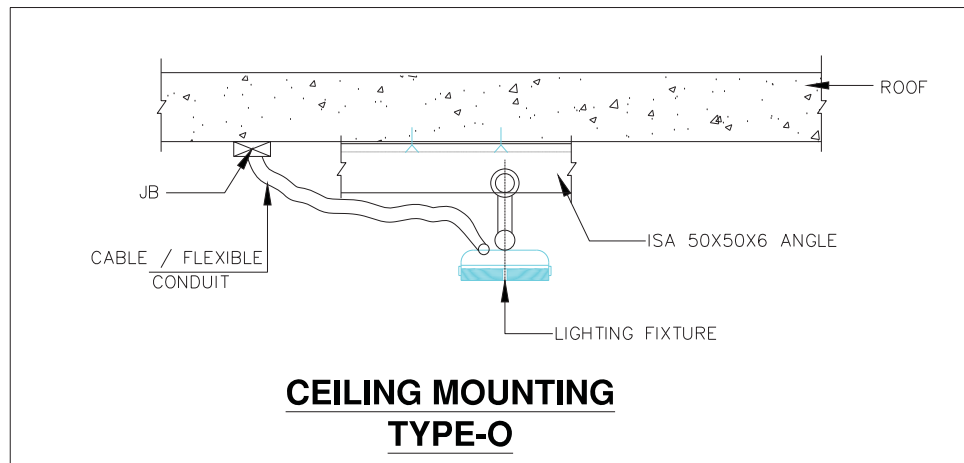
5.4 HF64 1 x 1000 Halogen, flood light, drip proof.

ANNEXURE-II



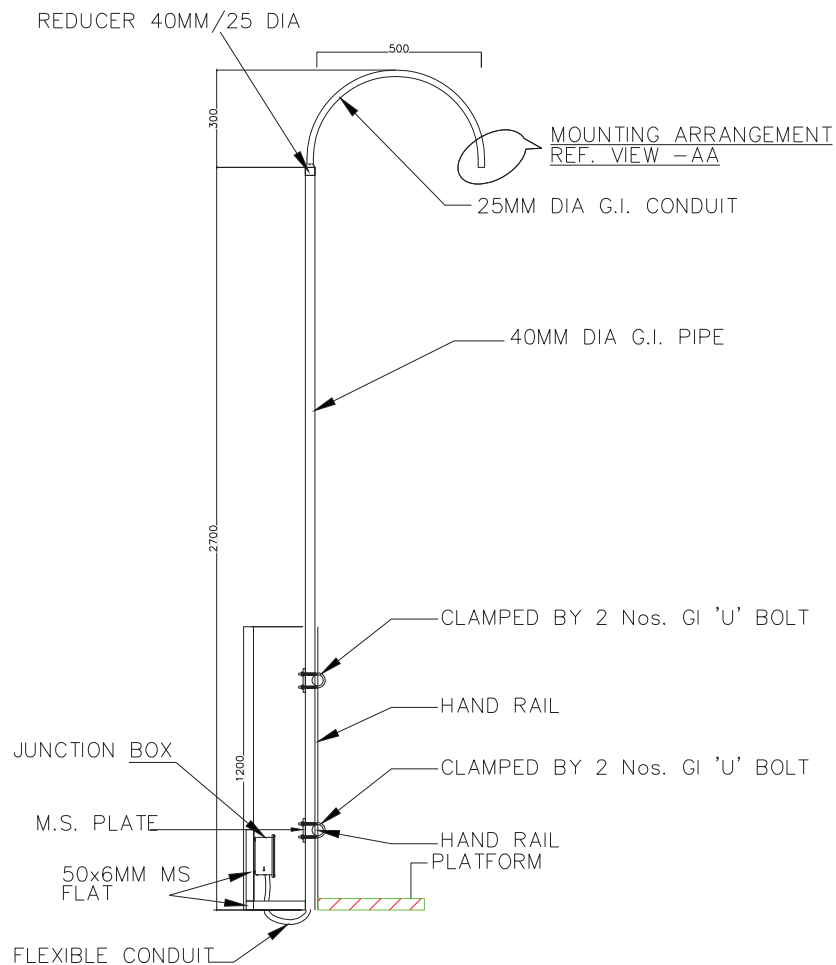
This is a Typical mounting arrangement dwgs/ details for guidance only. Final Mounting arrangement dwg shall be made by the successful bidder during detailed Engineering. It is to be noted that GI Conduit 20mm Dia and Flexible PVC Coated Conduit, Structural Steel shall be provided by BHEL. Balance all 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.

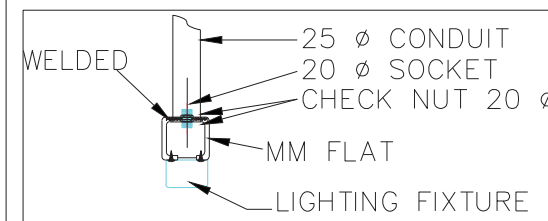
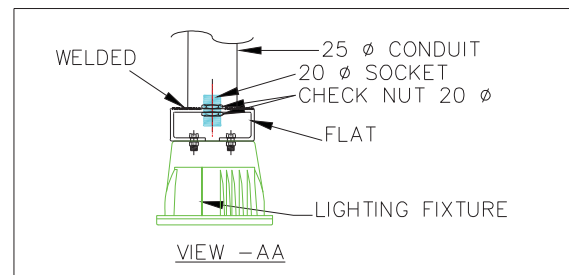
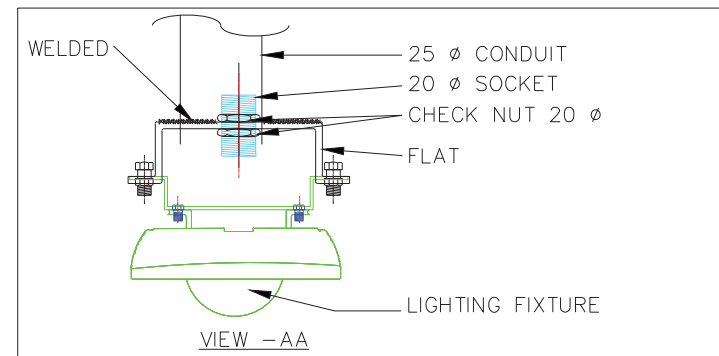


General Notes:

1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting layout, Mounting arrangement also shown. If any Descrrepancy 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.



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 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.

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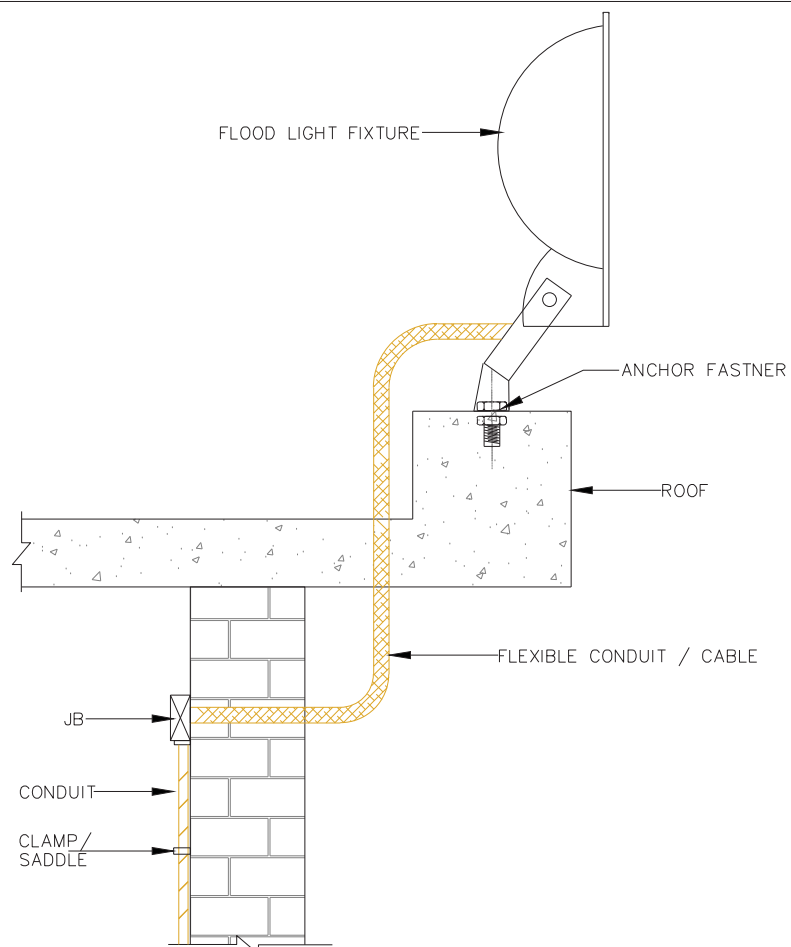
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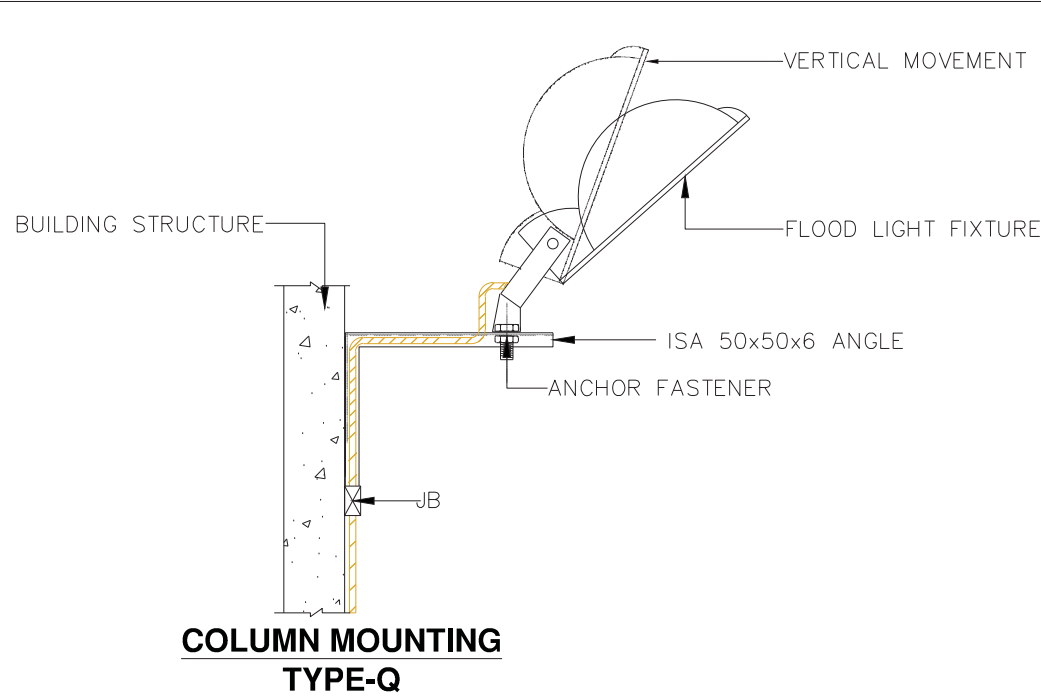
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**ROOF MOUNTING
TYPE-P**



**COLUMN MOUNTING
TYPE-Q**

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 Descerepancy 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.

SIZE-A4

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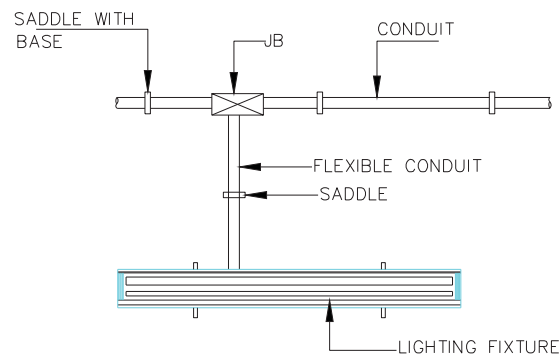
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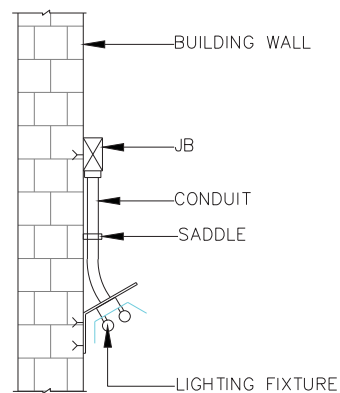
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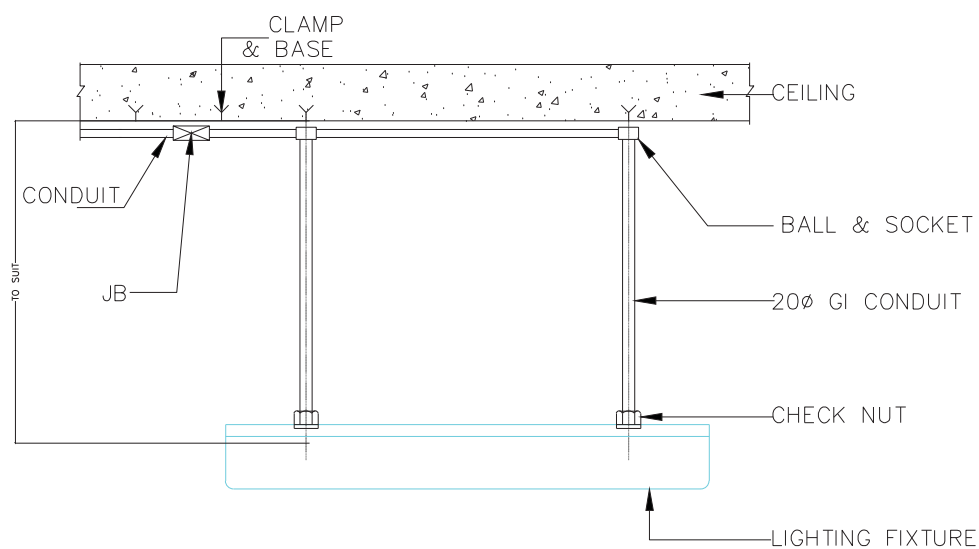
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**TYPICAL MOUNTING DETAIL OF
WALL MOUNTED, TYPE-D**



**END
VIEW**



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

General Notes:

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

SIZE-A4

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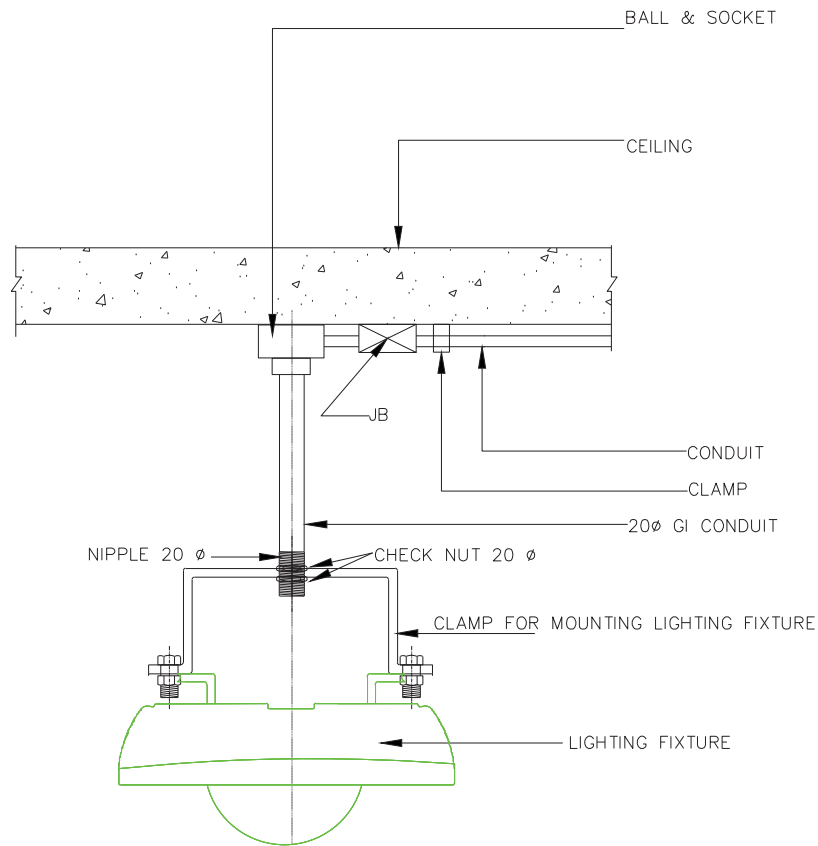
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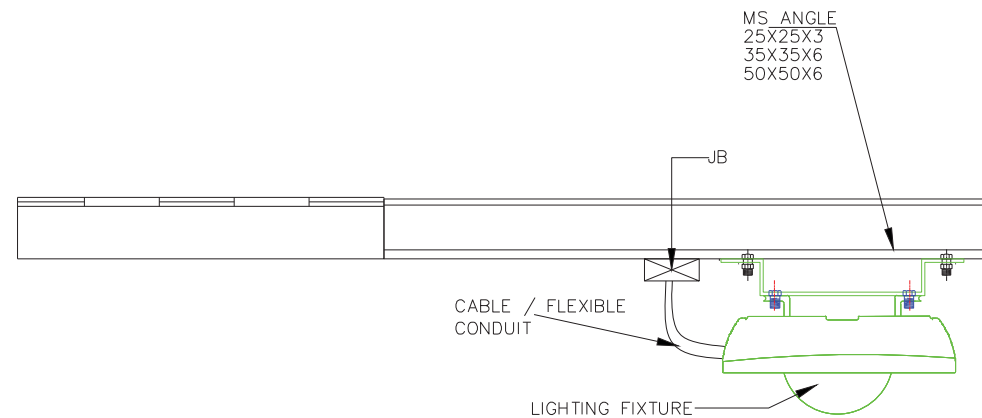
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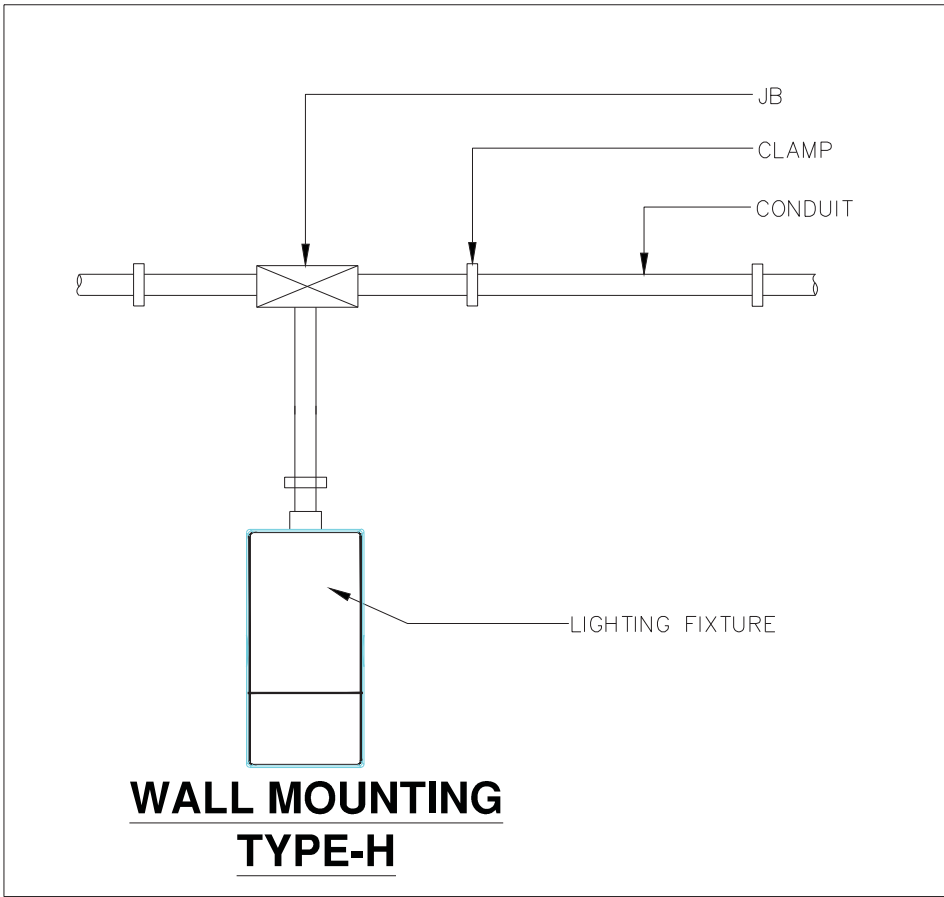
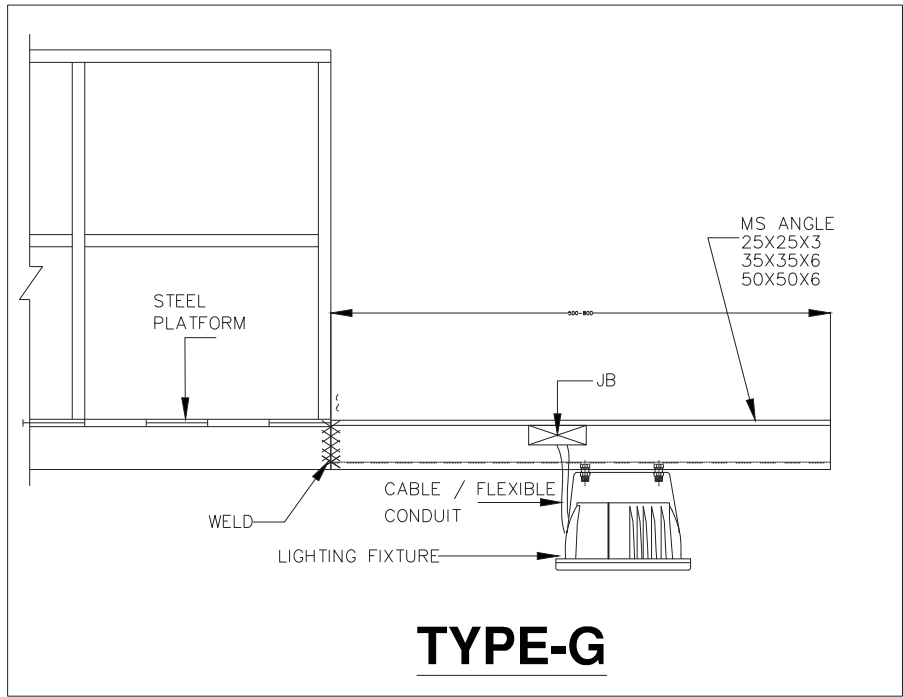
SUPPORTED FROM CEILING
TYPE-F



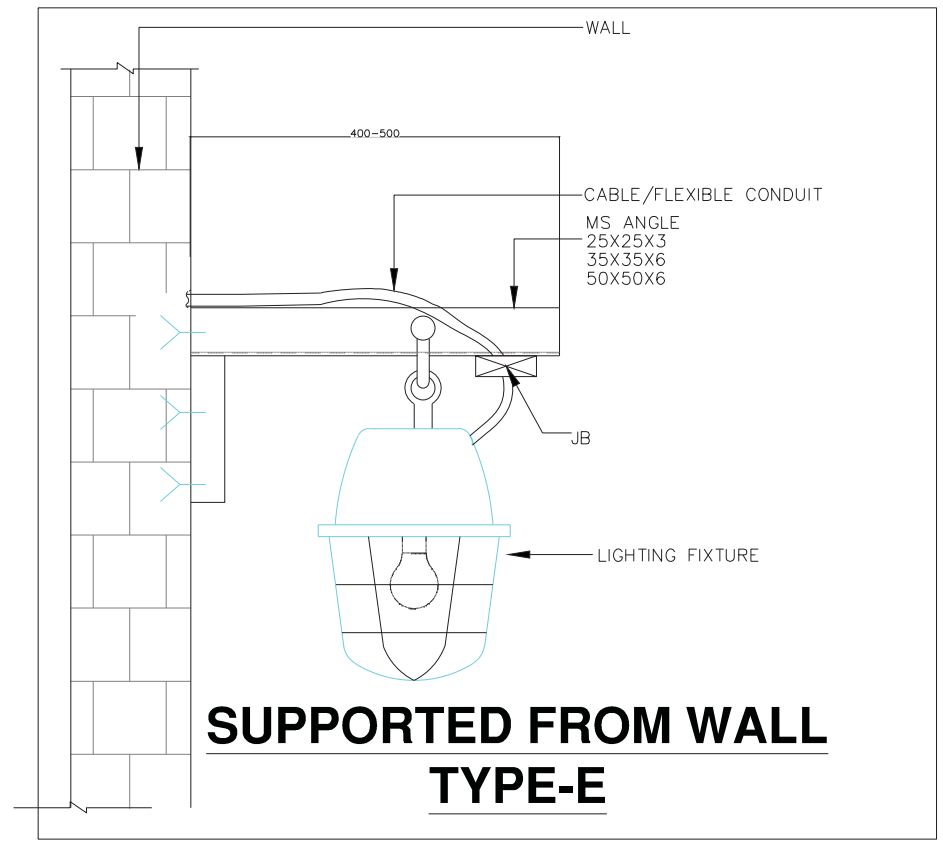
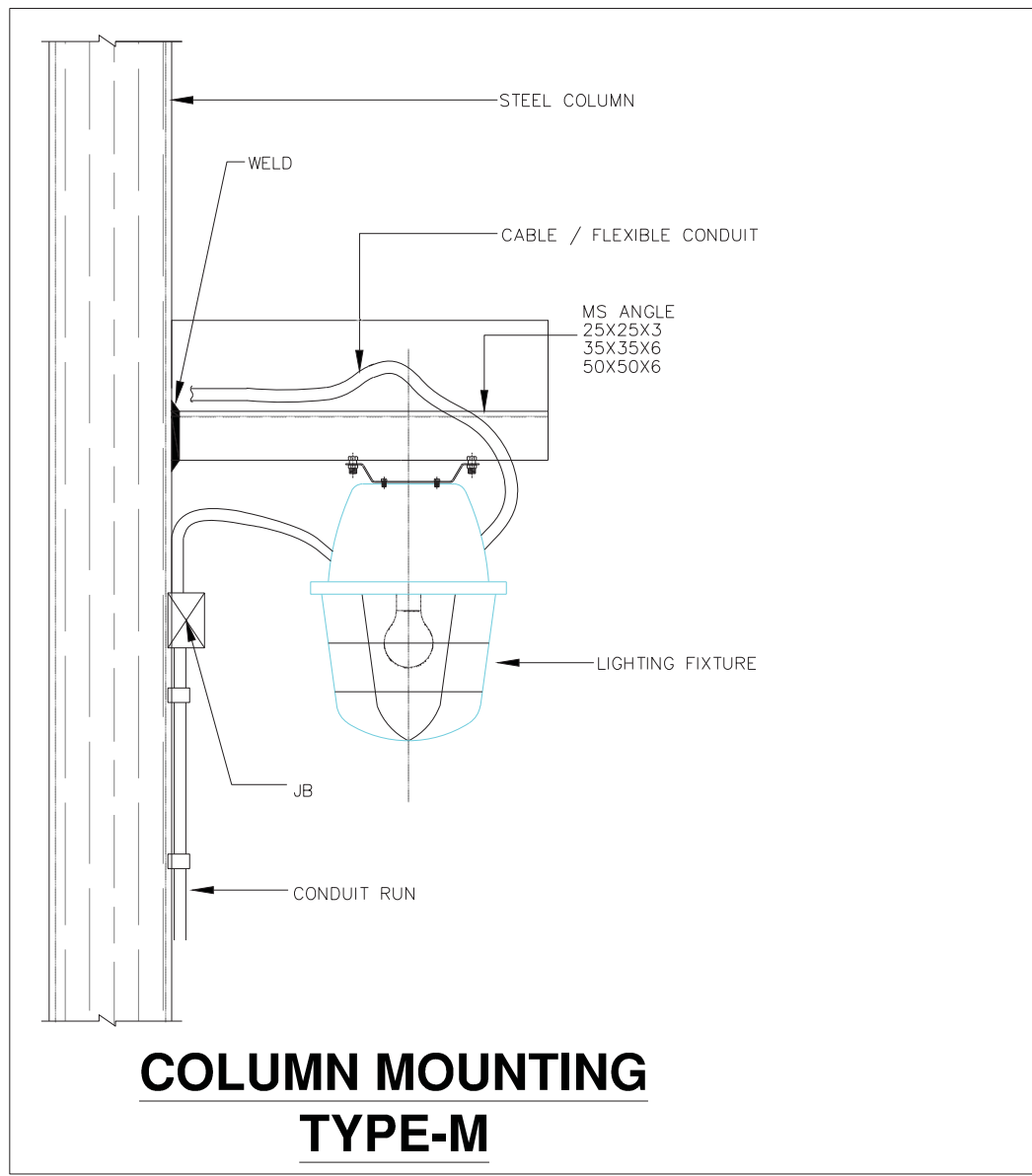
**SUPPORTED FROM CHANNEL/
STRUCTURAL STEEL**
TYPE-G

General Notes:

1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting 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 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 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 BOQ/TS.

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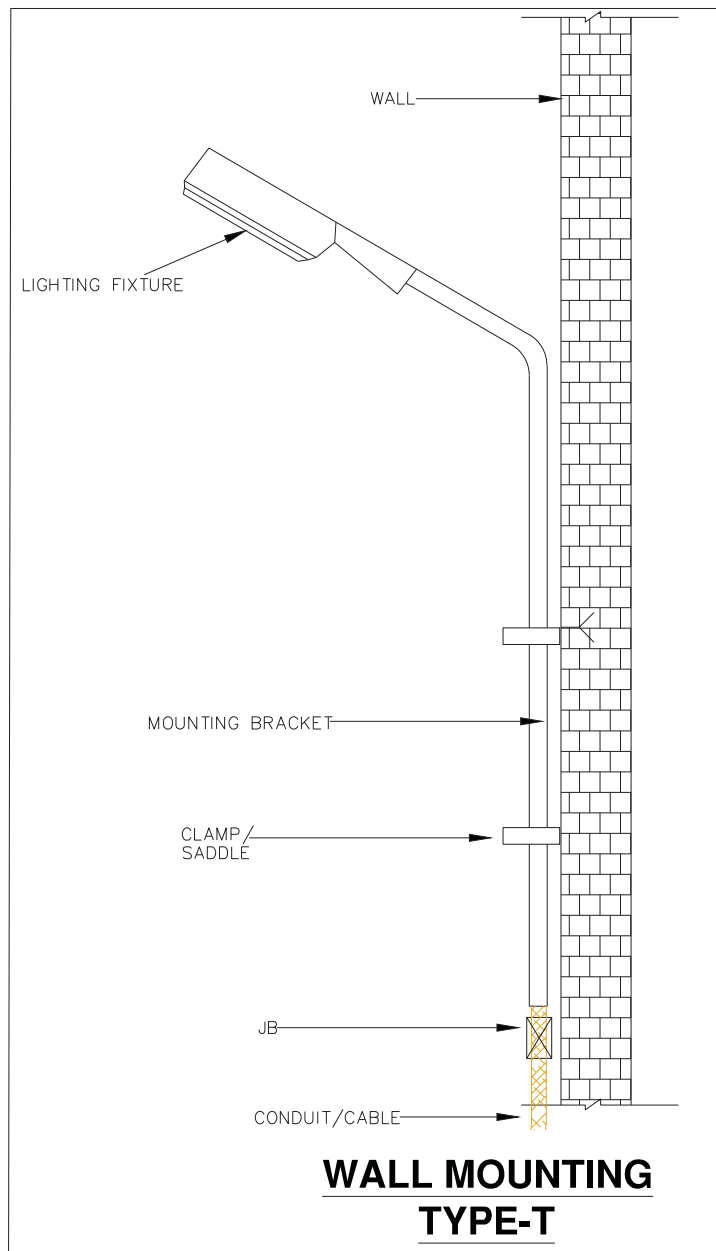
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**General Notes:**

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 BQ/TS.

SIZE-A4

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FLOOD LIGHT FIXTURE

WALL

FLEXIBLE CONDUIT

JB

CONDUIT

CLAMP/
SADDLEISA 50x50x6
ANGLE**WALL MOUNTING
TYPE-R**

General Notes:

1. Mounting arrangement can be changed/ modified on site as per site requirements.
2. In Lighting layout, Mounting arrangement also shown. If any 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 BQ/TS.

SIZE-A4

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|---|--|-----------------|--|---------------|------------------|--------------------------------|------------------|--------------------------------|--------|------------------|---------|
|  | 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 M C/ N | 7 | 8 | 9 | * 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 | | Sign & Date | Name |
| 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 RITESH KUMAR JAISWAL |

Digitally signed by Praveen Dutta
DN: cn=Praveen Dutta, o=BHEL,
ou=P5-PEM, Noida,
email=praveendutta@bhel.in, c=IN
Date: 2020.07.10 21:28:13 +05'30'

| BIDDER/ SUPPLIER | |
|------------------|--|
| Sign & Date | |
| Seal | |

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

Praveen
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 N |

| | | | | | | | | | | | | | |
|-----|-------------------------------------|---|-------|-------------------------|-----------|---|-------------------------------------|---|-------------------|--------|---|---|------------------|
| 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 | Reviewed by: | Sign & Date | Name | Seal |
| | 09.07.2020 | MEET SAGAR SINGH RAJPAL | | 09.07.20 | KUNAL GANDHI | | | | |
| Reviewed by: | | PRAVEEN DUTTA | Reviewed by: | Digitally signed by RITESH KUMAR JAISWAL | | Approved by: | | | |

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'

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|---|--|--|---|--|---------------------------------------|--|---------------------------------------|--|-------------------------|--|
|  | 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 |
|--------|------------------------|-----------------|-------|---------------|------------------|--------------------|------------------|------------------|--------|---------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | * | ** |
| | | | | | M C/ N | | | | D | M C N |

| | | | | | | | | | | | | | |
|-------------------------------------|-----------------|----|------------|------------------------|------------------------|--------------------|--------------------|-------------------|---|---|---|---|--|
| CONVENTIONAL TYPE LIGHTING FIXTURES | a) VISUAL | MA | VISUAL | IS 10322 (PART 5 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 (PART 5 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 | - | |

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| | Sign & Date | Name | | Sign & Date | Name |
| Prepared by: | 09.07.2020 | MEET SAGAR SINGH RAJPAL | Checked by: | 09.07.20 | KUNAL GANDHI |
| Reviewed by: | | PRAVEEN DUTTA | Reviewed by: | | RITESH KUMAR JAISWAL |

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|  | 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 4 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 |

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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| Reviewed by: | | PRAVEEN DUTTA | Reviewed by: | | RITESH KUMAR JAISWA |


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| BIDDER/ SUPPLIER | |
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| | | | ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS | | | SYSTEM:STATION LIGHTING SYSTEM | | SECTION: II | | SHEET 5 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 | |
| 1.3 | 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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| | | | ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS | | SYSTEM:STATION LIGHTING SYSTEM | | SECTION: II | | SHEET 6 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 | |


| 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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| Prepared by: | Sign & Date | Name | Checked by: | Sign & Date | Name | Reviewed by: | Sign & Date | Name | Seal |
| Reviewed by: | 09.07.2020 | MEET SAGAR SINGH RAJPAL | Reviewed by: | 09.07.20 | KUNAL GANDHI | Approved by: | | | |
| | | PRAVEEN DUTTA | | | RITESH KUMAR JAISWAL | | | | |

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| | | | ITEM: LIGHTING FIXTURES, LAMPS & MISC. ITEMS | | SYSTEM:STATION LIGHTING SYSTEM | | SECTION: II | | SHEET 7 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 | |

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|---|--|--|-------|---------|-------------------|-------------------|-------------------------------------|---|---------------------------|---|--------|---|---|---|
| | | 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 Sample | 1 Sample | Approved data sheet | THD<10% and pf >= 0.9 | Certificate of | √ | P | W | W | At lighting fixtures supplier test lab. |

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| Reviewed by: | | PRAVEEN DUTTA | Reviewed by: | Digitally signed by JAISWAL | RITESH KUMAR |


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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 | |

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|----|--|--|-------|------------|-------------------|-------------------|---------------------|--|---------------------------|---|---|---|---|--|
| | | | | | 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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| 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 M C/ N | 7 | 8 | 9 | * D | ** M C N | |

3.0 JUNCTION BOXES & RECEPTACLES

| ACCEPTANCE TESTS | | | | | | | | | | | | | | |
|------------------|------------------|---|-------|------------------|------------|------|------------------------------|------------------------------|----------------------|---|---|---|---|--------------------------------------|
| 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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| Reviewed by: | Praveen | Praveen Dutta | Reviewed by: | Jaiswal | Ritesh Kumar |


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| 1 | 2 | 3 | 4 | 5 | 6 M C/ N | 7 | 8 | 9 | * D | ** 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

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