	TECHNICAL SPECIFICATION & DATA SHEET FOR LIGHTING FIXTURES, LAMPS & MISC. ITEMS	Specification No.: PE-TS-481/491-558-E006
		Rev. No. 00
		Date : 19.07.2023


**2 X 500 MW NTPC SIPAT FGD System Package
&
4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD**

TECHNICAL SPECIFICATION
FOR
LIGHTING FIXTURES, LAMPS & MISC. ITEMS

SPECIFICATION No. **PE-TS-481/491-558-E006**




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

	TECHNICAL SPECIFICATION & DATA SHEET FOR LIGHTING FIXTURES, LAMPS & MISC. ITEMS	Specification No.: PE-TS-481/491-558-E006
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SCOPE

SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:		
1	SUPPLY INCLUDING DESIGN, ENGINEERING & MANUFACTURING	YES
2	INSPECTION & TESTING AT MANUFACTURER WORKS (CALIBRATION/CV TEST)	YES
3	E&C	NO
4	SUPERVISION OF ERECTION & COMMISSIONING	YES
5	MANDATORY SPARE	YES
6	O & M SPARE	NO
7	COMMISSIONING SPARE	NO
8	PACKING	YES
9	PAINTING	NO
10	TRANSPORTATION & DELIVERY TO SITE	YES
11	LIGHTING SYSTEM DESIGN	YES

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A. GENERAL INFORMATION

1	PROJECT	2 X 500 MW NTPC SIPAT FGD System Package & 4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD
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SYSTEM DATA

1	Design ambient temperature	50 °C
2	AC Supply	
a	Rated voltage	415V
b	Rated frequency	50 Hz
c	Voltage variation (permissible)	+10% to -10%
d	Frequency variation (permissible)	+3% to -5%
e	Combined voltage & frequency variation (sum of absolutes permissible)	10%
f	System fault level & duration	50 kA for 1 sec.
3	DC Supply	
a	Rated voltage	220
b	Voltage variation (permissible)	+10% to -15%
c	System fault level & duration	10 kA for 1 sec.

B. DESIGN CODES & STANDARDS

1	APPLICABLE STANDARDS	<ul style="list-style-type: none"> a) IS 3646 Code of practice for interior illumination. b) IS 6665 Code of practice for industrial lighting. c) IS 1944 Code of practice for lighting of public thoroughfare. d) IS 10322 Luminaires. e) IS 16101 General Lighting. LEDs & LED Modules Terms and definitions. f) IS 16102-1 Self-Ballasted LED lamps for General Lighting Services: Safety requirement. g) IS 16102-2 Self-Ballasted LED lamps for General Lighting Services: Performance requirement h) IS 16103-1 LED modules for General lighting safety requirements. i) IS 15885-2 Lamp Control gear. j) IS 16104 A.C. or D.C. supplied Control gear for LED modules k) IS 16105 Method of measurement of Lumen maintenance of solid state (LED) sources l) IS 16106 Method of electric and photometric measurement of solid state (LED) products m) IS 16107 Luminaires performance n) IS 1293 Plugs and socket outlets of rated voltage upto and including 250 volts and rated current upto and including 16 amperes o) IS 4160 Interlocking switch socket outlet p) IS 374 Electric ceiling type fans and regulators q) IS 2629 Recommended practice for hot dip galvanising of iron & steel r) IS 2603 Method of testing uniformity of coating on zinc coated articles s) IS 3480 Flexible steel conduits for electrical wiring t) IS: 3696 Scaffolds & ladders - Code of safety u) IS: 4571 Aluminium extension ladders
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C. TECHNICAL PARAMETERS / DESIGN FEATURES**Lighting Concept: Types of supplies considered (other than AC Normal)**

1	AC emergency	YES
2	DC emergency	YES

EQUIPMENT DETAILS

1	LUMINAIRES, LAMPS & ACCESSORIES	
a	Technical particulars of Lighting fixtures	As per Annexure-B

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b	Type of false ceiling for recessed LED luminaire	Grid False ceiling (600mm X 600mm) (for Control Room).
c	Degree of protection for drip proof luminaires	Outdoor: Min IP65 and weather Proof Indoor: Surface / pendant mounting :IP54 Recess mounting (false ceiling): IP20.
d	Hazardous area classification of flameproof lighting fixtures	
e	Type of LED Lamps	Cool Daylight
2	Emergency Lighting Unit	
a	Lamp type	LED
b	Nos. of Lamp	2
c	Lamp wattage	6
d	Lumen output of lamp at rated voltage	To be furnished by vendor
e	Type of battery	Ni-Cd
f	AH capacity of battery	To be furnished by vendor
g	Battery voltage	9 V
h	Battery backup time	4 Hrs
i	In-built charger	YES
3	Exit Sign	
a	Lamp type	LED
b	Nos. of Lamp	1
c	Lamp wattage	12
d	Lumen output of lamp at rated voltage	To be furnished by vendor
e	Type of battery	Ni-Cd
f	AH capacity of battery	To be furnished by vendor
g	Battery voltage	To be furnished by vendor
h	Battery backup time	4 Hrs
4	Junction Box (other than Street Light Junction box)	Provided with four (4) way stud type terminals for terminating upto 2 nos. 2.5 mm ² copper wire on each terminal, suitable for outdoor installations.
a	Enclosure material	Thermoplastic / thermosetting / FRP type.
b	Enclosure thickness	3 mm
c	Degree of protection	IP-55 for indoor & IPW-55 for outdoor
5	Industrial/ Welding Receptacle	
a	Enclosure material	MS sheet & hot dip galvanised / Die cast aluminium alloy / CRCA sheet steel with electrostatic powder coating
b	Enclosure thickness	2 mm (min) for MS sheet & hot dip galvanized / 2.5 mm (min) for die cast aluminium alloy / 2 mm (min) for CRCA sheet steel with electrostatic power coating
c	Process of galvanization	Hot dip galvanized
d	Weight of zinc (Thickness)	460 g/m ² (65 micron)
e	Degree of protection	IP-55

f	other details	<p>Industrial (20A) Receptacle:</p> <p>(i) 20A, 240V, 1-phase, 2 pole, 3-pin (third pin scrapping earth) porcelain, metal clad socket with a metallic cover tied to it.</p> <p>(ii) Rotary, heavy duty 20A switch conforming to applicable standard.</p> <p>(iii) Shrouded, die-cast aluminium plug.</p> <p>(iv) It shall be combined interlocked weather proof industrial unit.</p> <p>(v) Mechanical interlock shall be provided as follows :</p> <p><input type="checkbox"/> Switch can be put ON only when plug is fully engaged.</p> <p><input type="checkbox"/> Plug can be withdrawn only when switch is in OFF position.</p> <p><input type="checkbox"/> Cover can be opened only when switch is in OFF position.</p> <p>(vi) The arrangement should ensure that water does not enter the plug when socket is ON.</p> <p>(vii) Loop-in loop-out terminals shall be provided inside the box suitable for 4 mm² Cu wire.</p> <p>Welding (63A) Receptacle:</p> <p>(i) 63A, 415V, 3-phase-neutral earth, metal clad socket with cover</p> <p>(ii) Rotary, heavy duty 63A switch conforming to applicable standard.</p> <p>(iii) Shrouded, die-cast aluminium plug</p> <p>(iv) It shall be combined, interlocked weather proof industrial unit.</p> <p>(v) Mechanical interlock shall be same as that are applicable for RA type receptacles</p> <p>(vi) The receptacle boxes shall be suitable for entry and exit of 3.5CX70 mm²</p> <p>(vii) 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.</p>
6	Decorative Receptacle	
a	Enclosure material	CRCA sheet steel
b	Enclosure thickness	2 mm
c	Surface treatment	Galvanized
d	Process of galvanization	Hot dip galvanized
e	Weight of zinc (Thickness)	460 g/m ² (65 micron)
f	Degree of protection	IP-20
g	other details	<p>(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.</p> <p>(ii) Loop-in loop-out terminals similar to type RA shall be provided. These will be located in office areas.</p>
7	Switch Box	
a	Enclosure material	Galvanized MS Sheet.
b	Enclosure thickness	1.6mm MS sheet with 3mm thick decorative, Perspex cover.
c	Degree of protection	IP-20
d	Switchboard types	<p>(i) Type SWB1 - Switch board with 1 no. 5A switch, JB type SW1.</p> <p>(ii) Type SWB2 - 4 nos. 5A switches, JB type SW2.</p> <p>(iii) Type SWB3 - 6 nos. 5A switches, 1 No. 6 A Socket, JB type SW3.</p> <p>(iv) Type SWB4 - 8 nos. 5A switches, 2 No. 6A Socket, JB type SW4.</p> <p>JB-SW1 Provided with four (4) way stud type terminals, each terminal suitable for terminating upto two nos. of 2.5 mm² copper wires.</p> <p>JB-SW2 Similar to the JB-SW1 but provided with ten (10) way terminals.</p> <p>JB-SW3 Similar to the JB-SW1 but provided with eighteen (18) way terminals.</p> <p>JB-SW4 Similar to the JB-SW1 but provided with twenty four (24) way terminals.</p>
8	Flexible conduit	
a	Type	TERNE coated conduit
b	Size	20 mm dia
c	Standard length	25 to 50 m
9	Cable Glands	By vendor for all incoming and outgoing cables/wires
a	Type	Double compression
b	Material	Brass
c	Nickel Plating provided	YES
d	Flameproof glands with flameproof equipment	YES

10	Cable Lugs	By vendor for all incoming and outgoing cables/wires
a	Type	Crimping type/ ring type
b	Material	Tinned copper
11	LADDERS	
a	Type	Both (Free standing and Wheel Mounted)
b	Material	Aluminium
c	Duty	Medium
d	Surface treatment	Galvanized

D. PACKING

1	PACKING	<p>a. The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.</p> <p>b. Lighting Fixtures, Lamps, Receptacles, Switchboards, 24V Supply modules, 24V sockets, Junction Boxes, Exit signs shall be clean and dry prior to packaging.</p> <p>c. 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.</p> <p>d. 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.</p> <p>e. 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.</p> <p>f. The dimensions of cartons shall be as per manufacturer's recommendations.</p> <p>g. For items like step ladder, wheel mounted ladder and flexible conduits, packing shall be as per manufacturer standard.</p> <p>h. 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.</p>
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GENERAL NOTES		
<p>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.</p>		
<p>2. Following sizes of 1100 V grade, PVC insulated, single core, stranded copper conductor wires will be used: Lighting Panel to Fixtures: 1.5 sq. mm (Cu) Lighting Panel to JB's/ Switches: 1.5 sq. mm (Cu) JB's/ switches to Fixtures: 1.5 sq. mm (Cu) Panel to First receptacles: 4.0 sq. mm (Cu) First receptacles to looping other receptacles: 4.0 sq. mm (Cu) In case of only one receptacles in ckt., Panel to receptacles: 4.0 sq. mm (Cu) Panel/ JB's to flood light fixtures: 2C x 1.5 sq. mm (Cu) Wiring in hazardous area if applicable, transformer yard, outdoor area (like Miscellaneous areas) will be done using 3C-2.5 sq. mm (Cu), PVC insulated, FRLS PVC sheathed armoured cable. Note: Wires & Cables are not in vendor's scope of supply, however vendor to show size & quantity in CLO drawings.</p>		
<p>3. Earthing of lighting system will be done by using of following sizes of wire / flat: Lighting Distribution Board: GS Flat 2x25x6 mm Lighting Panels: GS Flat 25x3 mm Lighting fixtures, receptacles, conduits, junction boxes & switch boxes: 14 SWG GI wire Welding receptacles: GS Flat 2x25x6 mm All the earthing to various equipment like LDB, lighting panels, poles (painted) , receptacles, junction boxes etc shall be provide at two point.</p>		
<p>4. Containers adequate for storing 70% of P.O. quantity material at site are to supplied. Vendor shall furnish suitable justification to purchaser du ring detailed engineering for the number and size of containers being supplied. Materials like Concrete Blocks of Paved surface required for installation and placing of container shall be made available by BHEL. Other supporting material like Rails etc. shall be part of Container only.</p>		
<p>5. Following items are excluded from the supply of this package: Poles, Mast, LDB, WDB, Lighting panels, Rigid conduit, and PVC Wires.</p>		
<p>6. Luminaires suitable for surface mounting shall also be suitable for pendant mounting. Knockouts of 20mm ET conduit fixation shall be provided for this purpose.</p>		
<p>7. 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".</p>		
<p>8. Typical Mounting arrangmeent of Lightng fixtures is shown in Annexure-F, all indicated accessories required for mounting of fixtures shall be supplied along with the respective lighting fixture.</p>		
<p>9. Vendor shall prepare and submit Lighting design calculation, lighting layout and conduit layout drawings considering the following requirements for purchaser's approval :</p>		
<p>9.1 Lighting calculations for indoor areas covering details such as room dimensions (length, width, height), illumination level, maintenance factor (Dust prone indoor/outdoor areas: 0.6, Control room and air conditioned areas : 0.8, Indoor areas (non-ac): 0.7), 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.</p>		
<p>9.2 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.</p>		

9.3 Single line diagrams of power distribution upto Lighting Panels. Separate drawing for complete lighting distribution shall also be prepared by vendor.

9.4 Loads on each phase of LP and LDB with consideration of diversity factor(50%) for sockets.

9.5 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.

9.6 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.

9.7 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.

9.8 Wiring and load distribution details for outdoor areas.


9.9 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.

10. The vendor shall guarantee satisfactory performance of the equipment supplied under all conditions and requirement as laid down by this specification.

11. Vendor shall ensure satisfactory performance for lighting system designed by them at site.


12. Bidder shall confirm compliance with the BHEL Standard Quality Plan (enclosed with the specificaiton) without any deviations.

13. LED modules and drivers shall be compatible to each other. The LED module driver's ratings and makes shall be as recommended by corresponding LED chip manufacturer

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ANNEXURE-A

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

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ANNEXURE-B

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



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ANNEXURE-C: TECHNICAL DETAILS OF LIGHTING FIXTURES

S. No.	Type of Luminaire	Description	Total Luminous Flux (Lumen) of Luminaire – Min. Value	Measured Electrical Input Power (Watt) of Luminaire – Max. Value
1	FC06 (LED)	Industrial type LED fixture suitable for conduit/ surface/ suspended mounting with integral driver aesthetically designed for Switchgear/ Equipment room/ stair case/ corridors.	3780	42
2	FC07 (LED)	Industrial type LED fixture suitable for conduit/ surface/ suspended/ column mounting with integral driver. Fixture shall operate at 220 V DC supply. Necessary accessories like DC to AC convertor etc. to be included in fixture, if required.	1260	14
3	FC30 (LED)	Panel 600mm x600mm decorative LED fixture suitable for recess mounting in false ceiling with integral driver aesthetically designed for Control Room/ Office.	3780	42
4	FC33 (LED)	Decorative, recessed type LED fixture (down lighter) with integral driver. Fixture shall operate at 220 V DC supply. Necessary accessories like DC to AC convertor etc. to be included in fixture, if required.	1260	14
5	FC81 (LED)	Corrosion proof, totally enclosed type LED fixture with integral driver.	3780	42
6	SF63 (LED)	Flood light, Heavy duty type LED fixture with integral driver.	16920	188
7	SB02 (LED)	High Bay, Industrial type LED fixture with integral driver.	16920	188
8	SB03 (LED)	High Bay, Industrial type LED fixture with integral driver.(Mounting Height > 10M)	22500	250
9	SS62 (LED)	Street light, LED fixture with integral driver.	10080	112
10	SW41 (LED)	Well glass, Dust proof LED fixture with integral driver	4500	50
11	SW42 (LED)	Well glass, Dust proof LED fixture with integral driver	7200	80

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		DATA SHEET-B		
(Bidder to fill details of luminaires as per parameters mentioned below and furnish Data Sheet – B along with technical offer)				
S. No.	DESCRIPTION	LUMINAIRE MAKE AND MODEL	MEASURED ELECTRICAL INPUT POWER	TOTAL LUMINOUS FLUX (LUMEN) OF LUMINAIRE -
	MAIN SUPPLY ITEMS		(W) MAX. VALUE	MIN. VALUE
1	Lighting Luminaires			
1.1	Luminaire Type FC06 (LED)			
1.2	Luminaire Type FC07 (LED)-DC			
1.3	Luminaire Type FC30 (LED)			
1.4	Luminaire Type FC33 (LED) -DC			
1.5	Luminaire Type FC81 (LED)			
1.6	Luminaire Type SF63 (LED)			
1.7	Luminaire Type SS62 (LED)			
1.8	Luminaire Type SW41 (LED)			
1.9	Luminaire Type SB02 (LED)			
1.10	Luminaire Type SW42 (LED)			

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ANNEXURE:D- SUB-VENDOR DIRECTORY

ITEM/SERVICE DESCRIPTION	MAKE
LIGHTING FIXTURES (LED)	Neev Luminaries
	HAVELLS INDIA LIMITED
	BAJAJ ELECTRICALS
	SURYA ROSHNI LIMITED
	PHILIPS
	M/S HPL ELECTRIC & POWER PVT. LTD
	INSTA POWER
	Pyrotech Electronics Pvt. Ltd.
	M/s Halonix Technologies Limited
	M/s JAQUAR & COMPANY PVT. LTD.
	M/s CROMPTON GREAVES CONSUMER ELECTRICALS LTD.
	M/s WIPRO ENTERPRISES PRIVATE LTD.
	M/s Nessa Illumination Technologies Pvt. Ltd.
	M/s Mika Engineers
	M/s Orient Electric Private Ltd.
M/s. Forus Electric Pvt. Ltd.	
CABLE CLAMPS & CABLE TIES	ELECTROMAC IND.CORPN.
	INCAB
CABLE GLANDS	NOVOFLEX MARKETING PVT. LTD.
	ALLIED TRADERS & EXPORTERS
	ARUP ENGG & FOUNDRY WORKS
	BALIGA LIGHTING EQPT.PVT.LTD.
	COMMET BRASS PRODUCTS
	DOWELLS
	ELECTROMAC INDUSTRIES
	INCAB
CABLE LUGS	DOWELLS
	UNIVERSAL MACHINES LTD.
FLEXIBLE CONDUITS (LEAD COATED)	PLICA INDIA PVT. LTD.
GALVANISING	Jenco Industrial Corporation
	National Galvanizing Company
	Sigma Galvanising Pvt. Ltd.
	B.P. Projects PVT LTD
	Standard Galvanisers
	Steel Products
	Unitech Fabricators & Engineers Pvt. Ltd.
	Shivam Engineers & Fabricators
	B.G. Shirke Construction Technology Pvt. Ltd
	Galbro Ispat Galvanizers Pvt. Ltd.
	Eros Infrastructures Pvt. Ltd.
	Industrial Perforation (India) Pvt. Ltd.
	Indmark Formtech Pvt. Ltd.
	Namdhari Industrial Traders Pvt. Ltd.
Neha Galvaniser	

	Patny Systems (P) Ltd.
	Parmar Metal Company
	Rukmani Electrical & Components Pvt Ltd
	Rukmani Fab & Gal Pvt Ltd
	DMP Projects Pvt.Ltd.
	Vinfab Engineers India Private Limited
	Saral Projects & Processors
	Brahampuri Steels Limited
	Indiana Gratings PVT. LTD
	M/s AVAIDS TECHNOVATORS PVT. LTD.
IND.POWER & WLDG SOCKETS	CROMPTON GREAVES
	CYCLE ELECTRIC DEVICE & SERV.CO.
	BCH
	BEST & CROMPTON
	AJMERA INDUSTRIES & ENGG. WORKS
JUNCTION BOXES (NON FLAME PROOF)	JASPER ENGINEERS PVT. LTD.
	Electro Controls & Devices
	M/s Shrenik & Co.
	M/s PHOENIX MECANO LTD.,
	Adroit Control Engineers Pvt.Ltd.
	M/s PHOENIX MECANO LTD.,
	MIKA ENGINEERS
	M/s PHOENIX MECANO LTD.,
	BAJAJ ELECTRICALS
	AJMERA INDUSTRIES & ENGG. WORKS
	S.B. ELECTRICAL ENGINEERING CORPORATION
	RITTAL INDIA PVT. LTD.
	HPL ELECTRIC AND POWER LTD.
LIGHTING SWITCH , SOCKET & S/F UNIT	ELEXPRO ELECTRICALS PVT/ LTD.
	ANCHOR
	KAYCEE
	L&T
	SIEMENS
	INDO ASIAN
MODULAR SWITCH BOARD	ANCHOR
	ELEXPRO ELECTRICALS PVT/ LTD.
	HAVELLS INDIA LIMITED
RECEPTACLES - DECORATIVE	ANCHOR
	ELEXPRO ELECTRICALS PVT/ LTD.
	BAJAJ ELECTRICALS
	AJMERA INDUSTRIES & ENGG. WORKS
TERMINAL BLOCKS	WAGO-CONTROLS
	CONNECT WELL
	ELMEX CONTROLS PVT. LTD.
	ESSEN DEINKI
	TECHNOPLAST
	M/s PHOENIX MECANO LTD.,
	ESSEN DEINKI
	AJMERA INDUSTRIES & ENGG. WORKS
	CROMPTON GREAVES

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RECEPTACLE (NON FLAME PROOF)	CYCLO ELECTRIC DEVICE & SERV.CO.
	BCH
	BEST & CROMPTON
EMERGENCY LIGHTING UNIT (FIXED & PORTABLE TYPE)- NON FLAME PROOF	BAJAJ ELECTRICALS
	PROLITE AUTOGLO LIMITED,
PEDESTAL FAN & CEILING FAN	REPUTED MAKE
EXIT SIGN (NON FLAME PROOF)	REPUTED MAKE
LIGHTING DESIGNER	AVAIDS TECHNOVATORS PVT. LTD.
	BAJAJ ELECTRICALS LTD.
	KELSATEK SOLUTIONS PVT. LTD.
	M/s SUMANAM ENGINEERING SERVICES CONSULTANT
	SPAN MANUFACTURING COMPANY LTD
	CITELUM INDIA PVT. LTD
	M/s SURYA ROSHNI LTD
	M/s HPL ELECTRIC & POWER PVT. LTD.
	M/s MIKA ENGINEERS.
	M/s. Forus Electric Pvt. Ltd.

	TECHNICAL SPECIFICATION & DATA SHEET FOR LIGHTING FIXTURES, LAMPS & MISC. ITEMS	Specification No.: PE-TS-481/491-558-E006
		Rev. No. 00
		Date : 19.07.2023

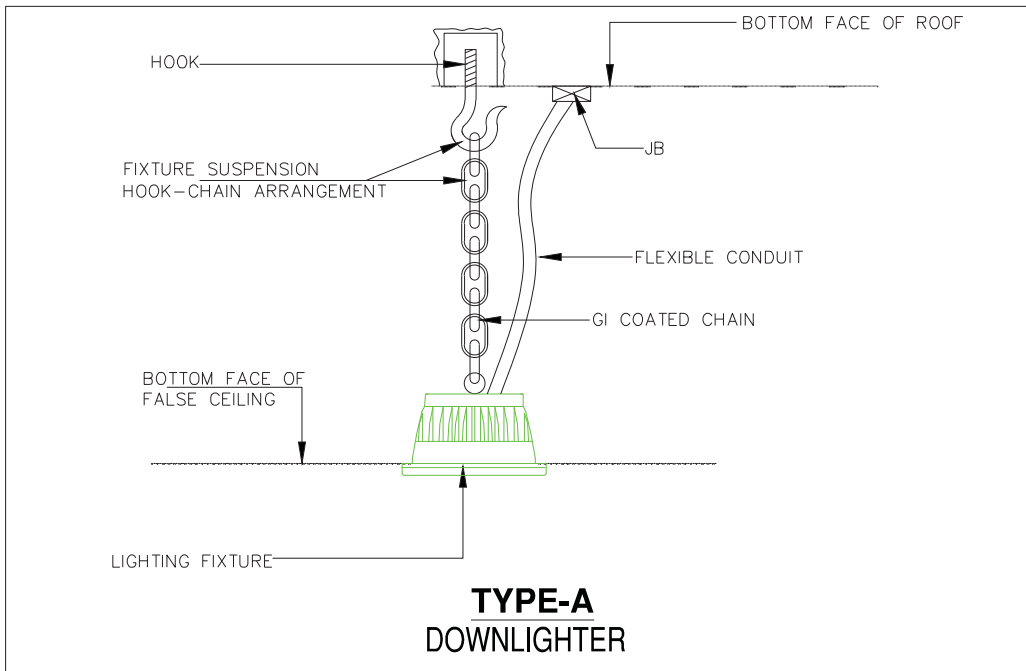
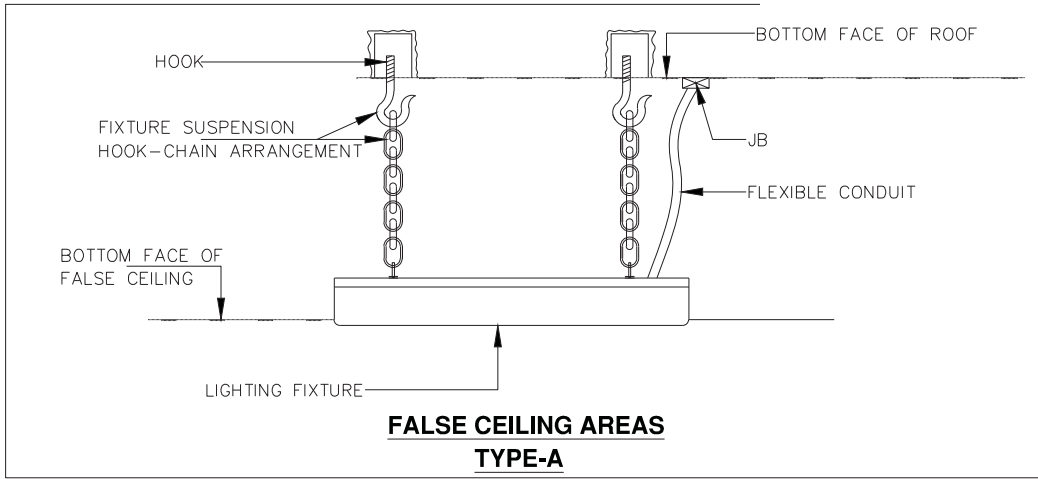
ANNEXURE:E- LIST OF DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT

BHEL Drawing No.	Drawing Title	Vendor Sub (Days)*	BHEL comment (Days)	Vendor Sub (Days)#	BHEL and Customer comment/approval (Days)
Primary Documents					
PE-V0-XXX-558-E101	GA DRAWING AND DATA SHEET OF LIGHTING FIXTURES	21	8	8	18
PE-V0-XXX-558-E102	GA DRAWING AND DATA SHEET OF MISC. ITEMS	21	8	8	18
PE-V0-XXX-558-E901	MQP FOR LUMINARIES	21	8	8	18
PE-V0-XXX-558-E905	MQP FOR MISCELLANEOUS ITEMS	21	8	8	18
Secondary Documents					
Submission schedule shall be same as Primary documents (after receiving input drawing from BHEL)					
PE-V0-XXX-558-E201	Lighting design Calculation				
PE-V0-XXX-558-E301	Lighting Layout				
PE-V0-XXX-558-E401	Conduit Layout				
PE-V0-XXX-558-E103	MOUNTING ARRANGEMENT LIGHTING FIXTURES				
PE-V0-XXX-558-E104	TYPE TEST REPORTS FOR LIGHTING FIXTURES				
PE-V0-XXX-558-E105	FIELD QUALITY PLAN OF LIGHTING FIXTURES				
PE-V0-XXX-558-E106	MOUNTING ARRANGEMENT OF MISC. ITEMS				
PE-V0-XXX-558-E107	TYPE TEST REPORTS FOR MISC. ITEMS				

NOTES

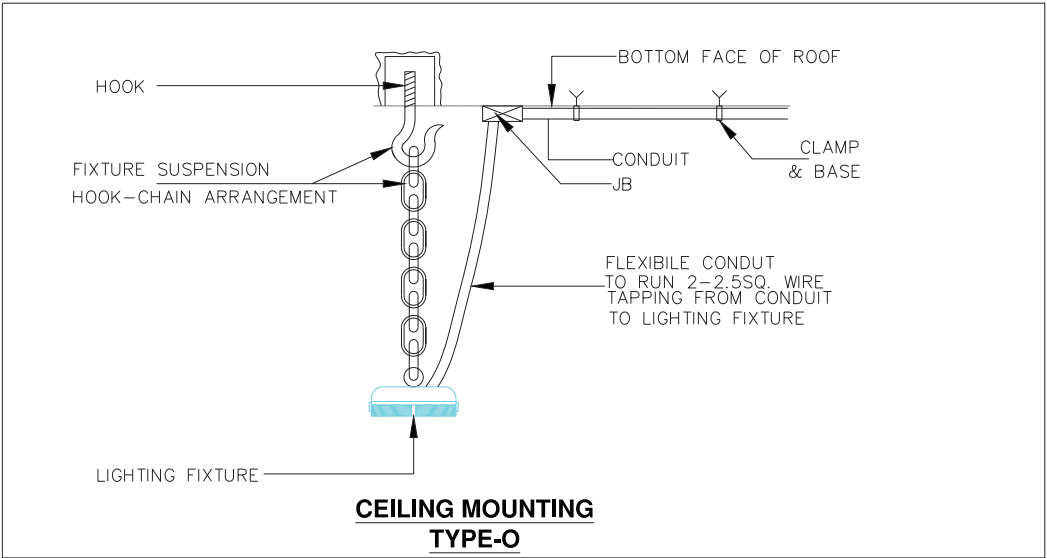
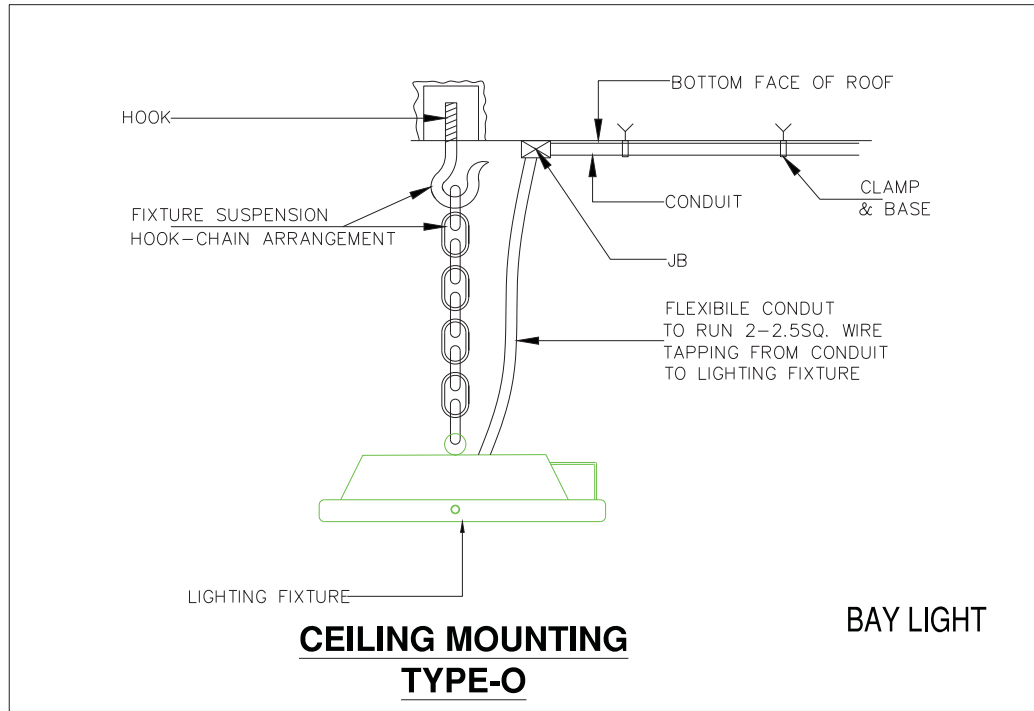
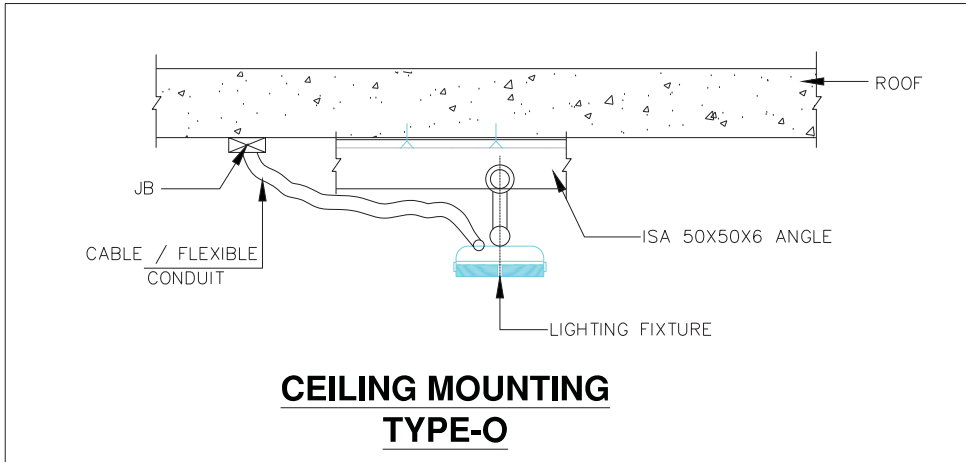
- * 1st submission within indicated days from date of purchase order
- # Submission (within indicated days) after incorporating all BHEL comments
- Primary documents shall be considered for Delay analysis
- Successful bidder to submit 2 sets of above documents. i.e. one for job no. 481- 4X210 MW+3X500 MW NTPC KAHALGAON-FGD & another for job no. 491 - 2x500 MW NTPC SIPAT FGD SYSTEM.

ANNEXURE-F TYPICAL MOUNTING ARRANGEMENT

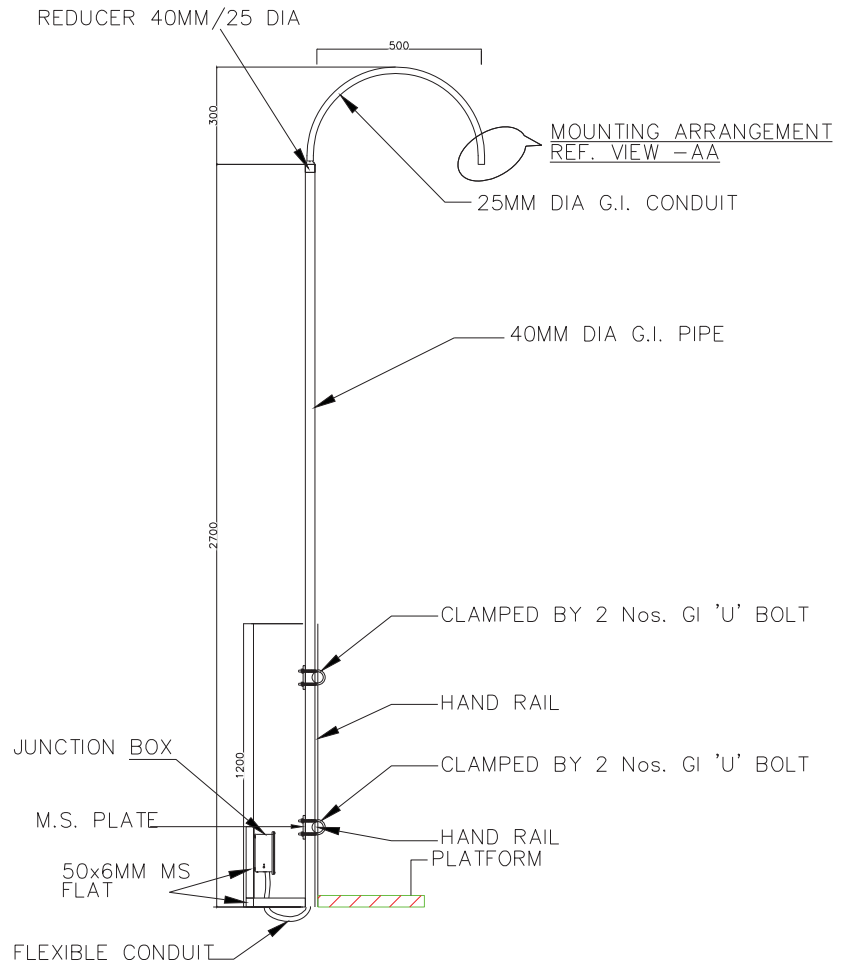


This is a typical mounting arrangement dwgs/ details for guidance only. Final Mounting arrangement dwg shall be made by the successful bidder during detailed Engineering. It is to be noted that GI Conduit 20mm Dia and Flexible PVC Coated Conduit, Structural Steel shall be provided by BHEL. Balance all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

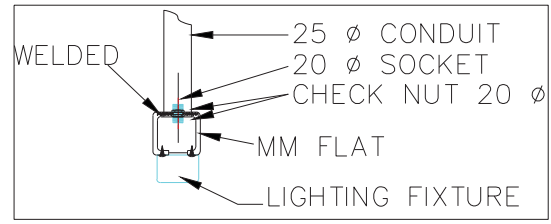
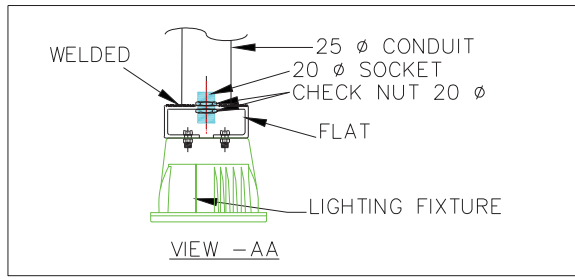
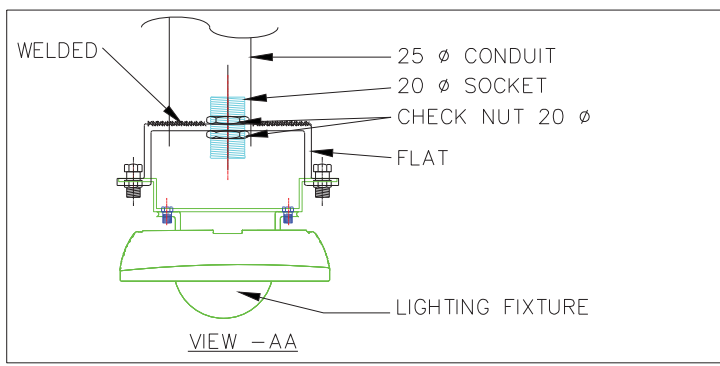
2. In Lighting layout, Mounting arrangement also shown. If any Discrepancy found on both documents than Consult with Design incharge/Site Incharge.
3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
4. If any new type of mounting required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



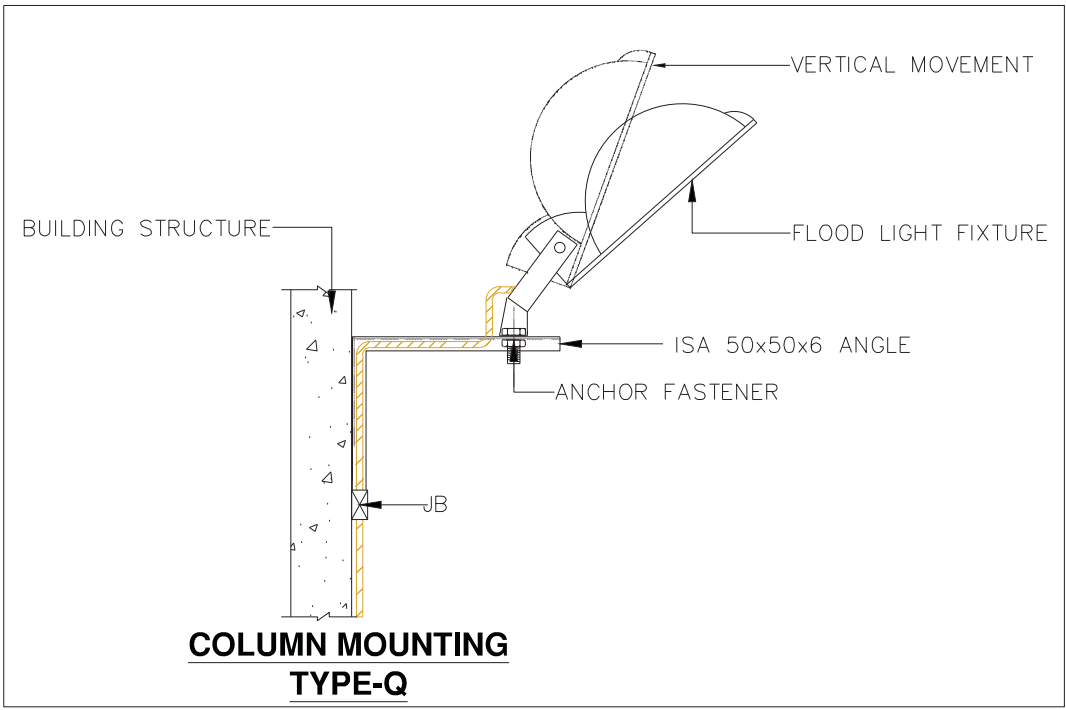
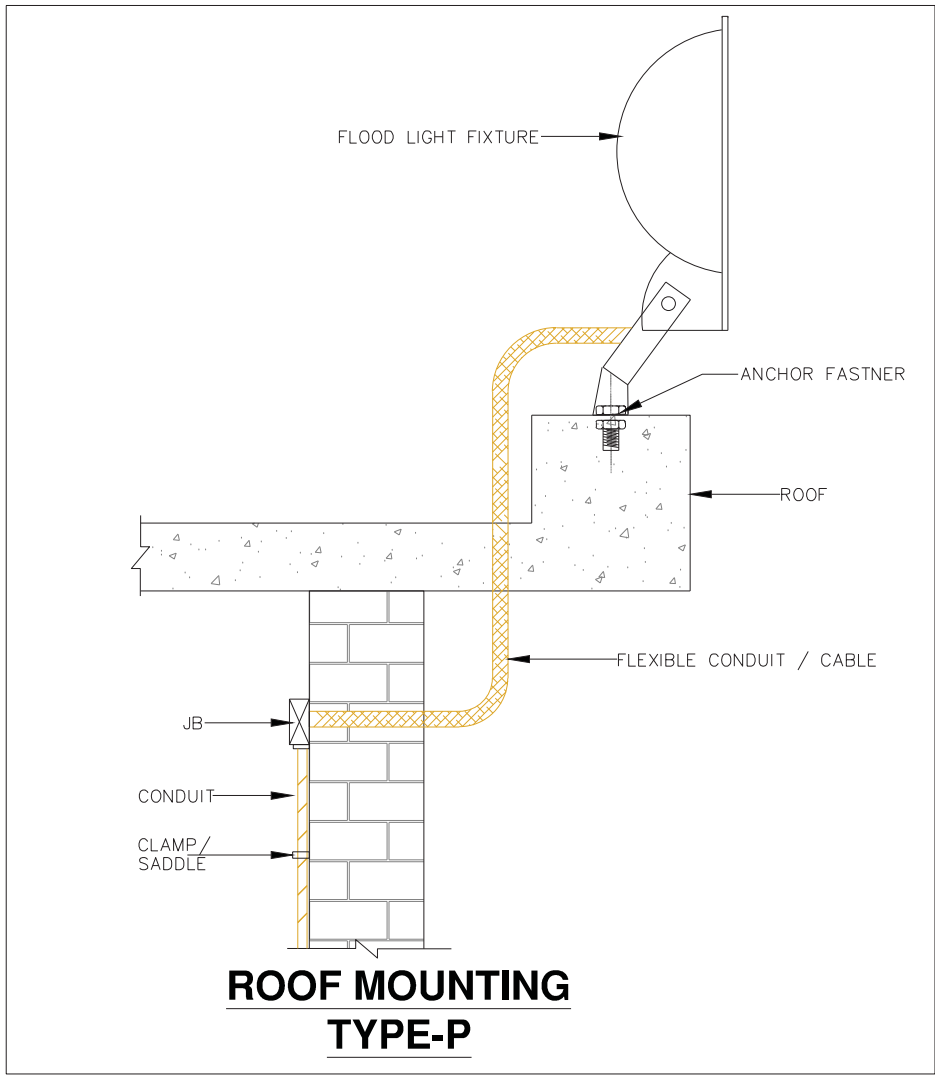
- General Notes:
1. Mounting arrangement can be changed/ modified on site as per site requirements.
 2. In Lighting layout, Mounting arrangement also shown. If any Descrepancy found on both documents than Consult with Design incharge/Site Incharge.
 3. Quantity and Material shown in drawings are indicative only and may be change or vary as per site requirement.
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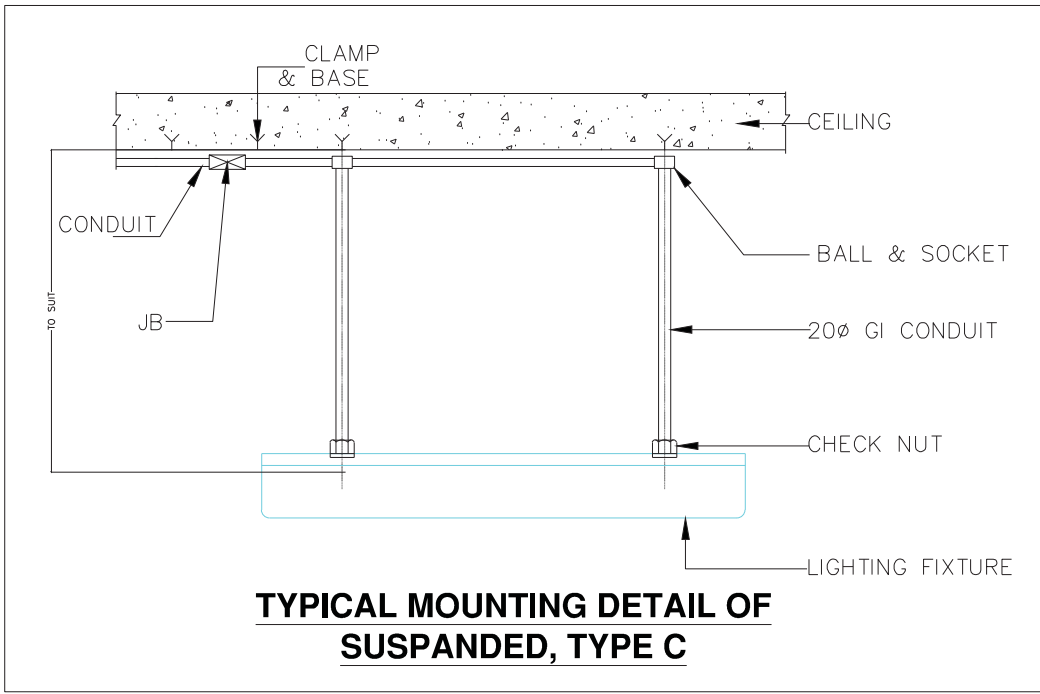
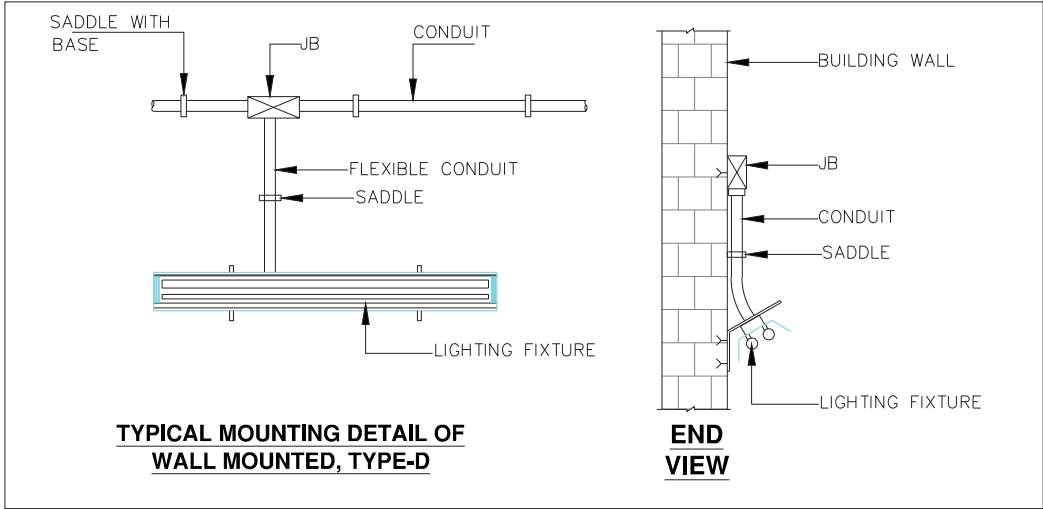
HAND RAIL MOUNTING TYPE-I



- General Notes:
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 2. In Lighting layout, Mounting arrangement also shown. If any Discrepancy found on both documents than Consult with Design incharge/Site Incharge.
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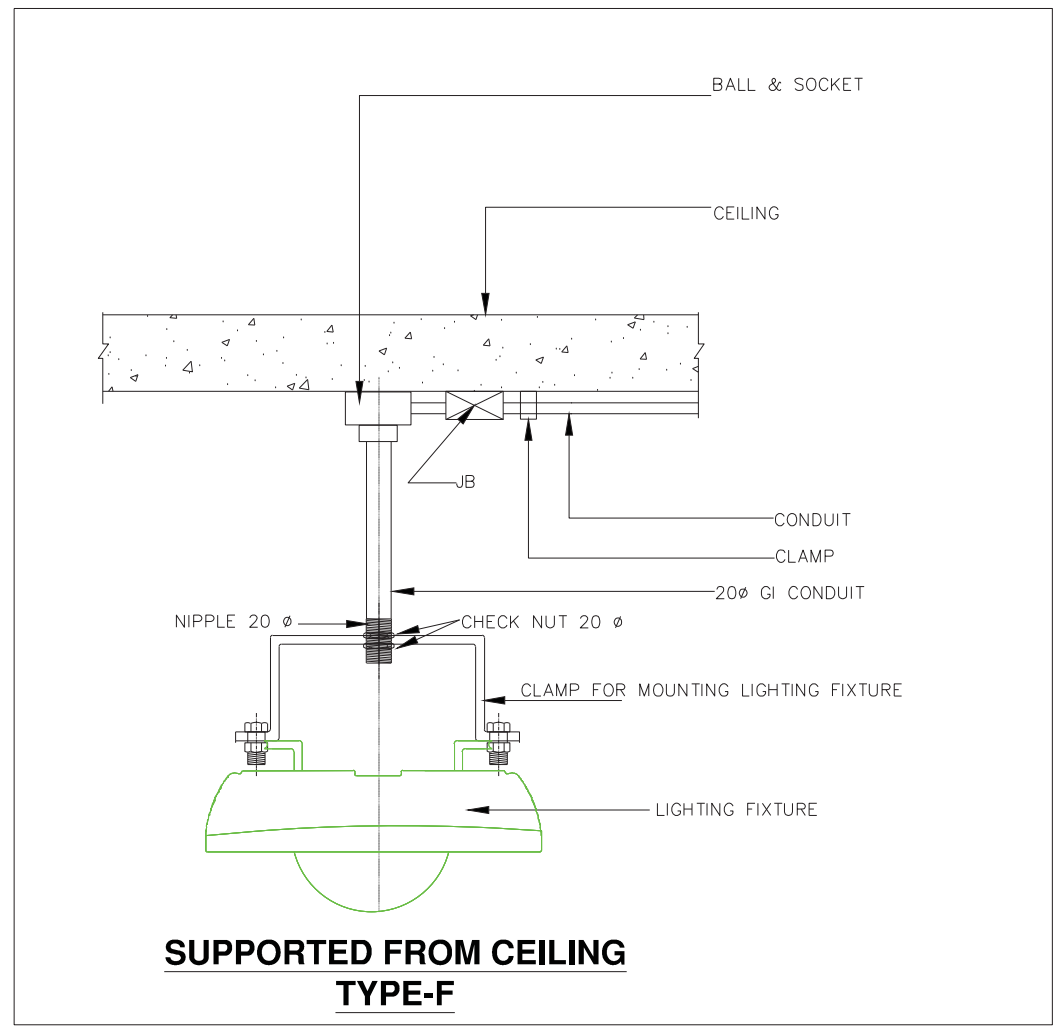


- General Notes:
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 5. All structural steel parts/supporting parts shall be hot dip galvanized as per BOQ/TS.

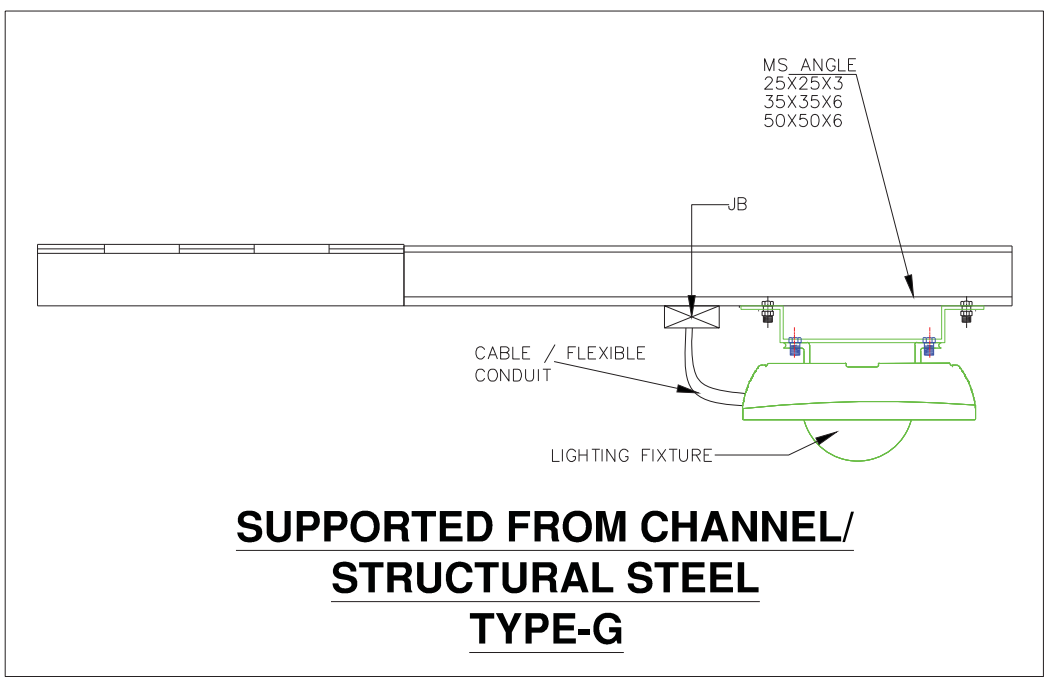
01 02 03 04 05 06 07 08

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**SUPPORTED FROM CEILING
TYPE-F**

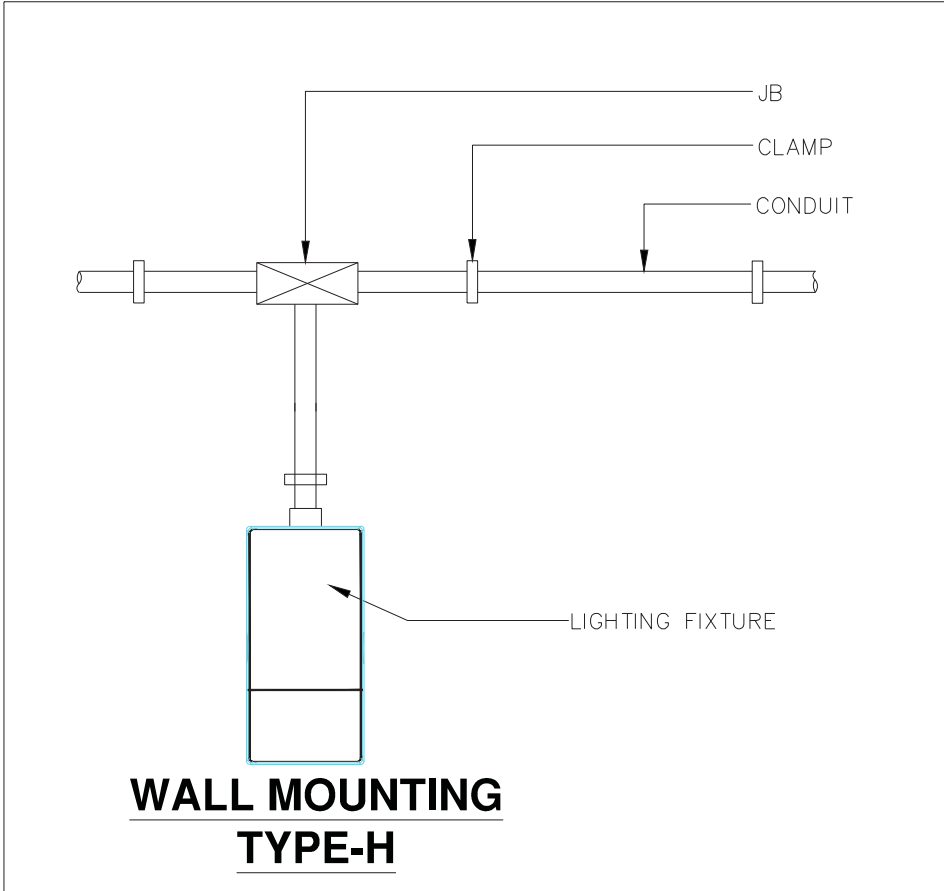
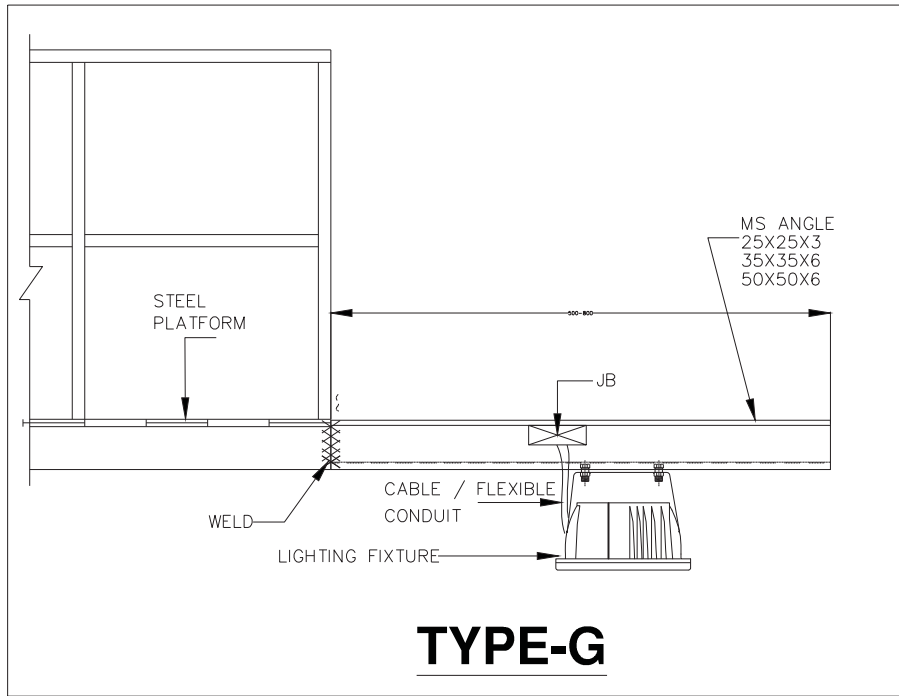


**SUPPORTED FROM CHANNEL/
STRUCTURAL STEEL
TYPE-G**

General Notes:

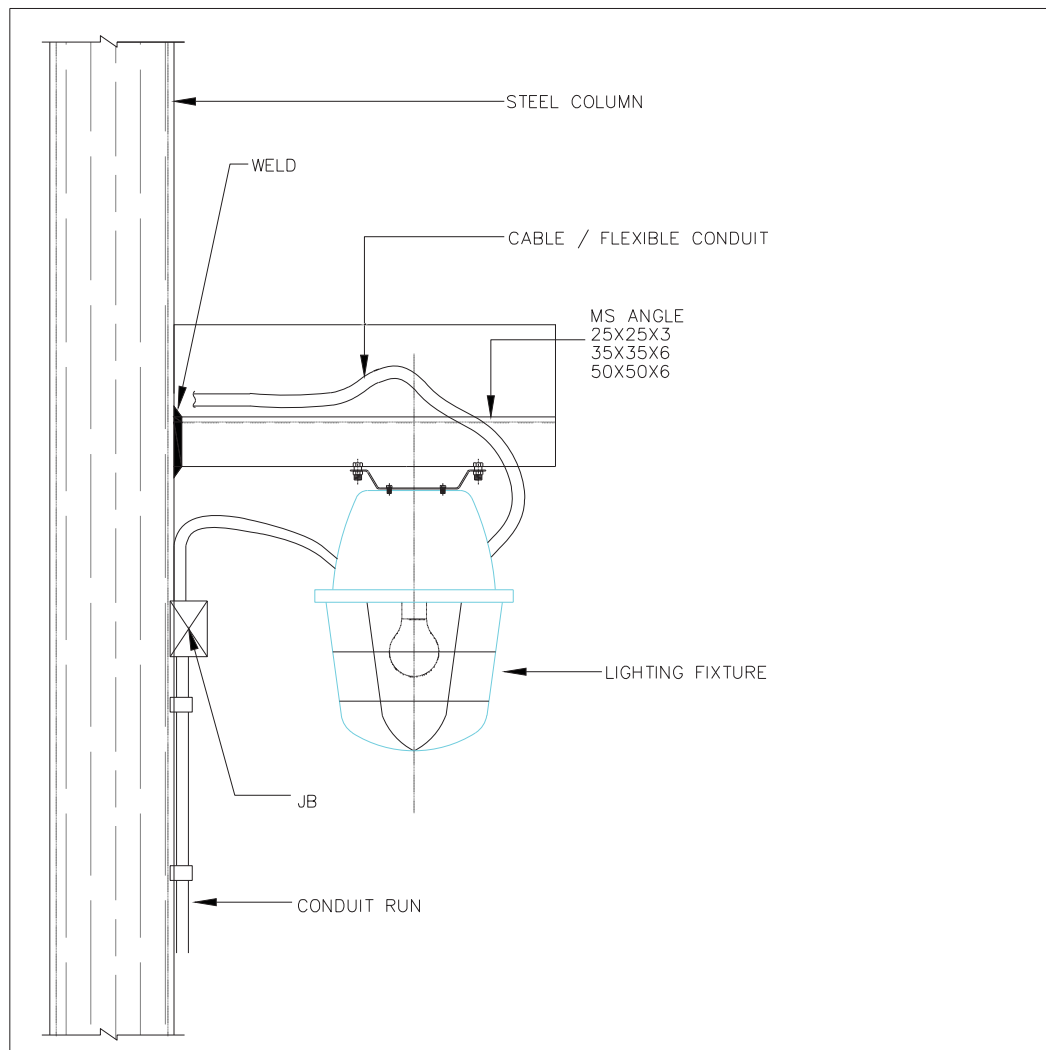
1. Mounting arrangement can be changed/ modified on site as per site requirements.
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5. All structural steel parts/supporting parts shall be hot dip galvanized as per BOQ/TS.

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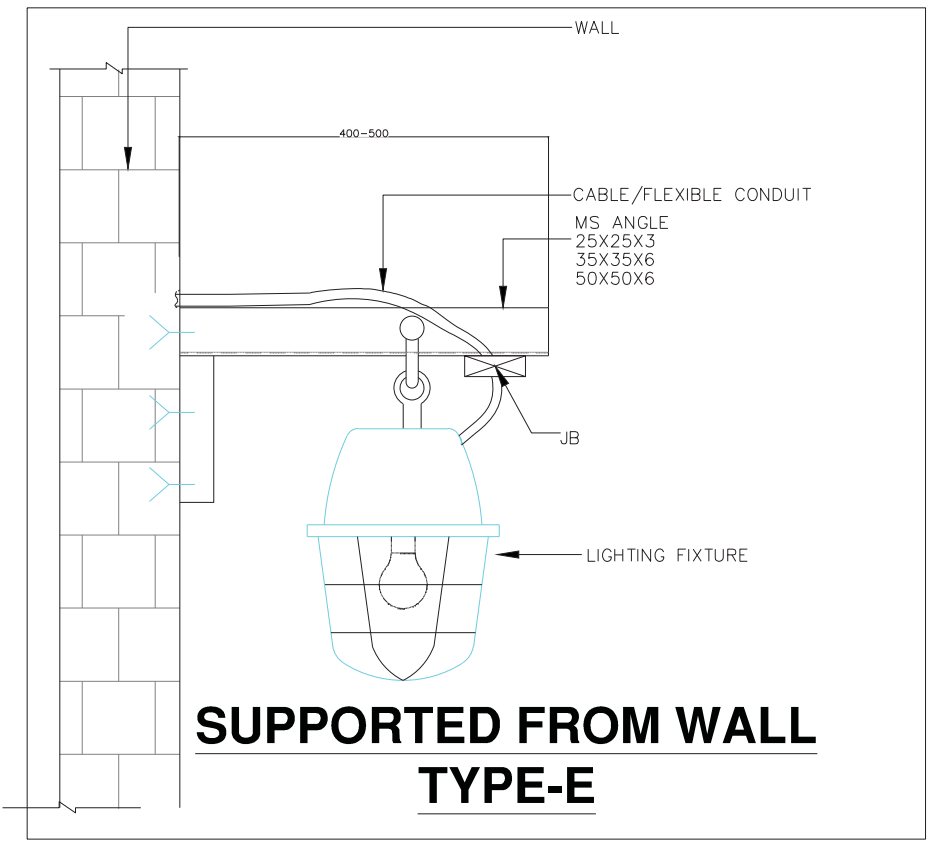


General Notes:

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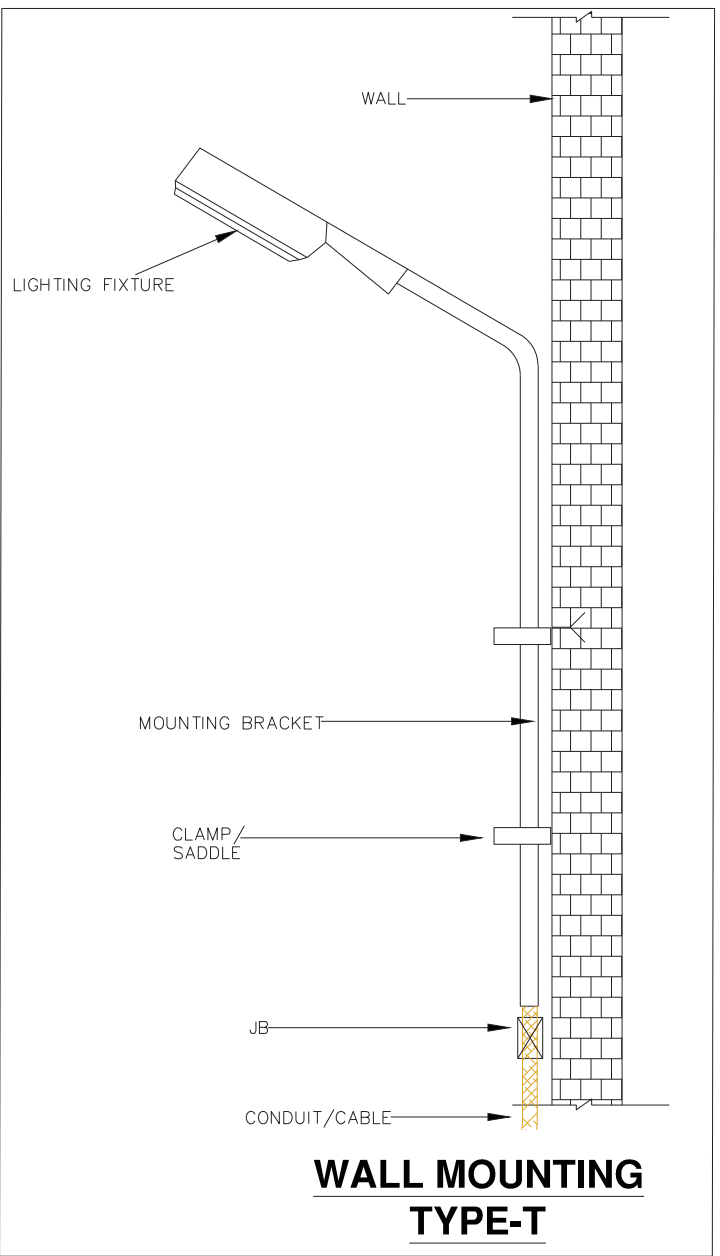
COLUMN MOUNTING
TYPE-M



SUPPORTED FROM WALL
TYPE-E

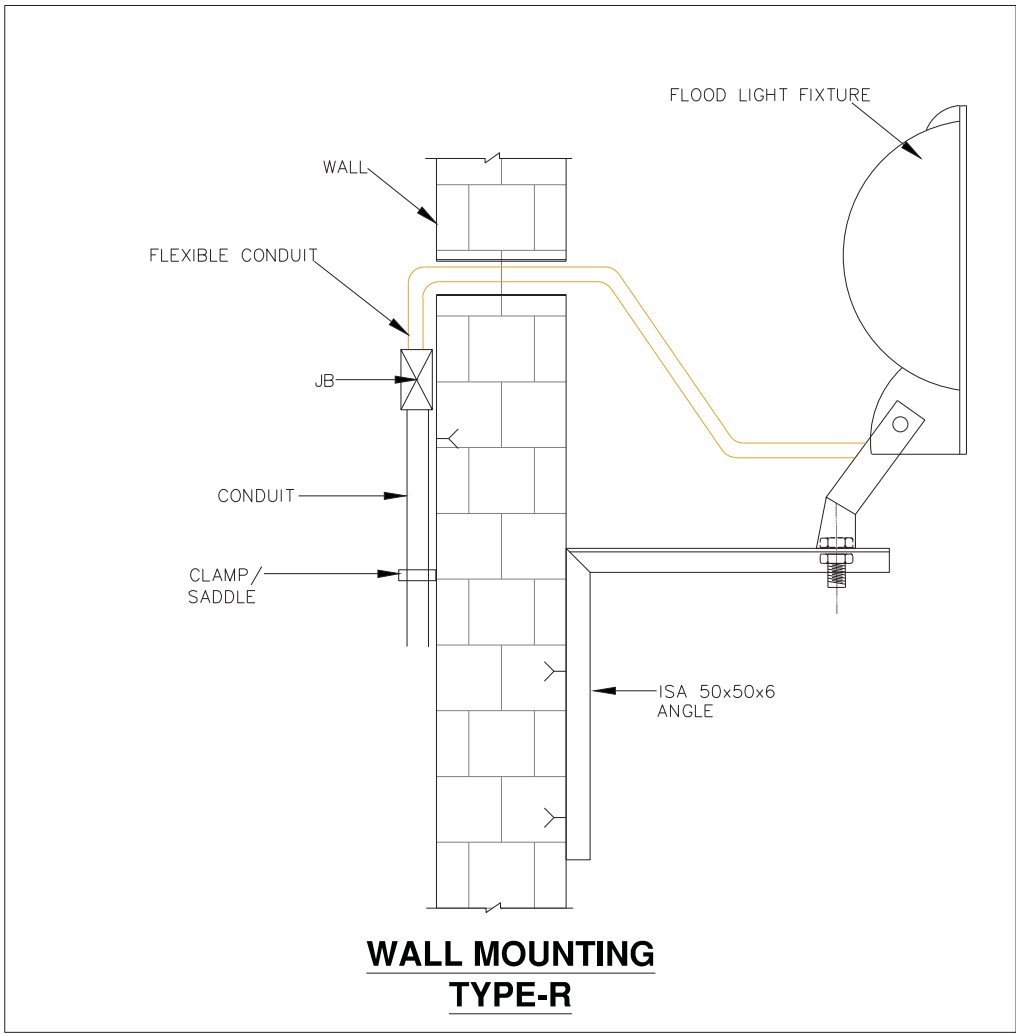
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5. All structural steel parts/supporting parts shall be hot dip galvanized as per BOQ/TS.




General Notes:

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General Notes:



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5. All structural steel parts/supporting parts shall be hot dip galvanized as per BQQ/TS.

NTPC		ITEM : LIGHTING FIXTURES (Conventional and LED type)		STANDARD QUALITY PLAN				Q.P.NO:0000-999-QOE-S-062		REVIEWED BY		APPROVED BY	
				CONFORMING TO CODE : As applicable				Rev No.: 08		SWAPNESWAR MISHRA			
								Date: 02/11/23		VIKRAM TALWAR			
								VALID UPTO: 01/11/25		SUNIL MAJANI			
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	REMARKS			
					6M	65N							
Note: 1) Lighting fixture supplier to ensure that constructional features of the lighting fixture (conventional & LED type) are as per NTPC specification requirements 2) Lighting fixture supplier to maintain all quality control records identified in this QP whether it is identified for NTPC verification or witness or not.													
Conventional type Lighting Fixture													
A	Bought out items / in-process checks												
1	Lamps	Make, rating & type	Major	Visual	1 sample per type	1 sample per type	NTPC specification requirements for rating & type, Make to be BIS approved with CML number	NTPC specification requirements for rating & type, Make to be BIS approved with CML number		V	-	-	
1.1	Electronic Ballast (if applicable)	a Certificate of compliance	Major	Visual	-	-	NTPC specification requirements	Certificate of compliance by ballast manufacturer / lighting fixture supplier that ballast meets all NTPC specification requirements	Certificate of compliance	V	-	-	
		b THD and pf check	Major	Electrical	Min 1 std.	-	NTPC specification requirements	THD <= 0% , pf >= 0.9 for FH type and pf >= 0.95 for other type of fluorescent lighting fixtures	Inspection report	P/V	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor as Verified by lighting fixture supplier
1.2	Castings	Freedom from defects	Major	Visual	Min 1 std.	-	NTPC specification requirements	Castings shall be free from any defects such as blow holes, surface blisters, cracks and cavities etc.	Inspection report	P/V	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor as Verified by lighting fixture supplier
1.3	Sheet metal forming and fabrication	Freedom from defects	Major	Visual	Min 1 std.	-	NTPC specification requirements	sheet metal fabrication / forming etc should be as per manufacturer drgs	Inspection report	P/V	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor as Verified by lighting fixture supplier
1.4	Pre-treatment and powder coating	Pre-treatment process checks, Powder coating finish, thickness, uniformity of coating and adhesion	Major	Visual, chemical & mech	Min 1 std.	-	Manufacturer standard, NTPC specification requirements	Nominal coating thickness 50 microns or more	Inspection report	P/V	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor as Verified by lighting fixture supplier

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

Format No.: QS-01-QAI-1-10/F3-R0

Engg. Div./CA&I

Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK		QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	DP	M	C	N	REMARKS
				6.M	5.CN									
		ITEM : LIGHTING FIXTURES (Conventional and LED type)		STANDARD QUALITY PLAN CONFORMING TO CODE : As applicable				QP.NO:800-999-Q0 :S-062 Rev No: 00 Date: 02/11/15 VALID UPTO: 01/11/18	REVIEWED BY SWAPNESWAR MSHRA VIKRAM TALWAR SUNIL MALAN	APPROVED BY 				
3	Acceptance Tests on conventional Lighting fixture	a) Details of lot offered and Certificate of compliance that lighting fixture supplier has inspected the offered lot as per their own standard.	Majcr	Visual	-	-	lighting fixture supplier to submit the details of lot offered for NTPC inspection (Type of lighting fixtures, their batch number, sub-vendor name, quantity)	COC	List		P	V	V	The list may be used by NTPC for sample selection
		b) Lamp make	Majcr	Visual	100%	100%	Make to be BIS approved with CML number	Make to be BIS approved with CML number	Certificate of compliance		V	V	V	
		c) Constructional features including: Internal wiring, terminal block, earthing terminal, safety chain (if applicable)	Majcr	Visual	1 sample per type	1 sample per type	NTPC specification and NTPC approved data sheet/drg.	NTPC specification and approved data sheet/drg.	Inspection report		P	W	W	
		d) Electronic Ballast (if applicable for offered lighting fixtures) THD and pf check	Majcr	Electrical	1 sample per type	1 sample per type	NTPC specification	THD <=10% , pf >= 0.9 for FH type and pf >= 0.95 for other type of fluorescent lighting fixtures	Inspection report		P	W	W	At lighting fixture supplier test lab
		e) Resistance to moisture test in case of lighting fixtures having IP X4 and above rating	Majcr	Mechanical	1 sample per type	1 sample per type	NTPC approved data Sheet	IS 10322 Part 1	Inspection report		P	W	W	
		f) Resistance to dust (applicable if IP5X and above)	Majcr	Optical	Mnfr std.	Mnfr std.	NTPC approved Data sheet and accepted type test report	Certificate of compliance	Certificate of compliance		P/V *	V	V	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
		f) Photometry check	Majcr	Optical	Mnfr std.	Mnfr std.	NTPC accepted type test reports	Certificate of compliance for the batch : not offered lighting fixture LOR is not be less than 90% (refer IS 16100) with reference to type test reports	Certificate of compliance		P/V *	V	V	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
		g) Dimensions	Majcr	Visual	1 sample per type	1 sample per type	NTPC specification and approved data sheet/drg.	NTPC specification and approved data sheet/drg.	Inspection report		P	W	W	
		h) HV & IR test	Majcr	Visual	#	#	IS 10322 part 1	IS 10322 part 1	Inspection report		P	W	W	# As per Table 1 (Inspection Level S2) and Table 2C/AQL 2.5 of IS 2500

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 P: PERFORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLDPOINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS "W".

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


Engg. Div./QA&I

COMPONENT & OPERATIONS		ITEM : LIGHTING FIXTURES (Conventional and LED type)	STANDARD QUALITY PLAN				Q.P.NO:0000999-QOE-S-462		REVIEWED BY		APPROVED BY	
			CONFORMING TO COIE : As applicable				Rev No.: 01	Date: 02/11/5	SWAPNESWAR MISHRA		VIKRAM TALWAR	
		CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMA OF RECORD		REMARKS	
					GM	GCN			A	C		N
									D*	10	11	
LED type Lighting fixture												
Bought out items / in-process checks												
LED Chip	LED chip efficacy	Major	Visual	Mnfr Std	Mnfr Std	NTPC Spec, Appd. Data sheet/ LM 81 report	NTPC Spec/ Appd Data sheet	LM 80 report	V	V	V	At the time of final inspection
	LED chip CRI and CCT	Major	Visual	Mnfr Std	Mnfr Std	NTPC Spec, Appd. Data sheet/ LM 81 report	NTPC Spec/ Appd Data sheet	LM 80 report	V	V	V	At the time of final inspection
	Reported TM21 (L80) lifetime of LED chip	Major	Visual	Mnfr Std	Mnfr Std	NTPC Spec, Appd. Data sheet/ LM 81 report	NTPC Spec/ Appd Data sheet	LM 80 report	V	V	V	At the time of final inspection
LED Driver	a Compatibility with LED module/chip, controls & protection features as per NTPC spec	Major	Visual	-	-	NTPC spec requirements	Certificate of compliance by LED driver manufacturer / lighting fixture supplier that driver meets all NTPC specification requirements	Certificate of compliance	V	V	V	
	b THD and pf check	Major	Electrical	Mnfr std.	-	NTPC specification	THD < 1% and pf >= 0.9	Inspection report	P/ Y	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
Castings	Freedom from defects	Major	Visual	Mnfr std.	-	NTPC specification requirements	Castings shall be free from any defects such as blow holes, surface blisters, cracks and cavities etc.	Inspection report	P/ Y	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
Sheet metal forming and fabrication	Freedom from defects	Major	Visual	Mnfr std.	-	NTPC specification requirements	sheet metal fabrication / forming etc should be as per manufacturer standards and good engg practices	Inspection report	P/ Y	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
Pre-treatment and powder coating	Pre-treatment process checks, Powder coating finish, thickness, uniformity of coating and adhesion	major	Visual, chemical & mech	Mnfr std	-	Mnfr standard , NTPC specification requirements	Nominal coating thickness 50 microns or more	Inspection report	P/ Y	-	-	P/V * - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier

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

Engg. Div./QA&I

		ITEM : LIGHTING FIXTURES (Conventional and LED type)		STANDARD QUALITY PLAN				OP.NO:0006-999-QCE-S-062		REVIEWED BY		APPROVED BY	
		CONFORMING TO CODE : As applicable				Rev No.: 00		Date: 02/11/15		SWARNESWAR MISHRA		VIKRAM TALWAR	
SI No	COMPONENT & OPERATIONS	CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS
					6 M	6 CN			9	10*	10**	10	
B	Acceptance Tests on LED Lighting fixture	a 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 fixture supplier to submit the details of lot offered for NTPC inspection (Type of lighting fixtures, their batch number, sub-vendor name, quantity)	-	List	P	V	V	The list may be used by NTPC for sample selection
		b LED chip make	Major	visual	-	-	NTPC accepted type test reports (LM80/LM79) report	Certificate of compliance	Certificate of compliance	V	V	V	
		c Constructional features including: Internal wiring, terminal block, earthing terminal, safety chain (if applicable)	Major	visual	1 sample per type	1 sample per type	NTPC specification and NTPC approved data sheet/drg.	NTPC specification and approved data sheet/drg.	Inspection report	P	W	W	
		e Resistance to moisture test in case of lighting fixtures having IP X4 and above rating	Major	mechanical	1 sample per type	1 sample per type	NTPC approved data Sheet	IS 10:22 Part I	Inspection report	P	W	W	
		f Resistance to dust (applicable if IP5X and above)	Major	optical	Mnfr std.	Mnfr std	NTPC accepted type test reports	Certificate of compliance	Certificate of compliance	P/V*	V	V	P/V* - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier
		f Photometry check	Major	optical	Mnfr std.	Mnfr std	NTPC accepted type test reports, LM 79, IS 16106, IS 16107	Certificate of compliance for the batch that offered lighting fixture LOR and lighting fixture efficacy is not be less than 90% (refer IS 16107) with reference to type test reports	Certificate of compliance	P/V*	V	V	P/V* - means test will be performed either by lighting fixture supplier or their sub-vendor and Verified by lighting fixture supplier

LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (/) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC
 P: PERFORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS 'W'.
 Format No.: QS-01-QAI-P-10/F3-R0 Engg. Div./QA&I

Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS	
					6 M	6 CN			9	10	11	12		
												M		C
ITEM : LIGHTING FIXTURES (Conventional and LED type)		STANDARD QUALITY PLAN CONFORMING TO CODE : As applicable						QF.NO:000-999-QC-S-062	REVIEWED BY	APPROVED BY				
								Rev No.: 00	SWANESWAR MSHRA					
								Date: 02/11/15	VIKRAM TALWAR					
								VALID UPTO: 01/11/18	SUNIL MALANI					
		g	Dimensions	Major	Visual	1 sample per type	1 sample per type	NTPC specification and approved data sheet/drg.	NTPC specification and approved data sheet/drg.	Inspection report	P	W	W	
		i	LED driver: THD and pf check	Major	Electrical	1 sample per type	1 sample per type	NTPC specification	THD < 10% and pf >= 0.9	Inspection report	P	W	W	At lighting fixture supplier test lab
		j	LED driver: Precision current control check	Major	Electrical	1 sample per type	1 sample per type	NTPC specification	NTPC specification and NTPC approved data sheet	Inspection report	P	W	W	
		k	LED driver: Open circuit protection simulation check	Major	Electrical	1 sample per type	1 sample per type	NTPC specification	NTPC specification and NTPC approved data sheet	Inspection report	P	W	W	
		l	LED driver: Short circuit protection simulation check	Major	Electrical	1 sample per type	1 sample per type	NTPC specification	NTPC specification and NTPC approved data sheet	Inspection report	P	W	W	
		m	LED driver: Over temperature protection simulation check	Major	Electrical	1 sample per type	1 sample per type	NTPC specification	NTPC specification and NTPC approved data sheet	Inspection report	P	W	W	
		n	LED driver: Overload protection simulation check	Major	Electrical	1 sample per type	1 sample per type	NTPC specification	NTPC specification and NTPC approved data sheet	Inspection report	P	W	W	
		o	LED driver: Surge protection compliance check	Major	Electrical	-	-	NTPC specification	Certificate of compliance that surge protection is provided	Certificate of compliance	V	V	V	

LEGEND: * R: RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/ SUB-SUPPLIER; C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLD POINT BY NTPC; SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS 'W'.
 Format No.: QS-01-QAI-P-10/F3-R0 Engg. Dir./QA&I

1594976/2023/PS-PEM-EL



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

DOC. NO. PE-PQ-481/491-558-E006

REV. 00

**4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD &
2 X 500 MW NTPC SIPAT FGD SYSTEM PACKAGE**

DATE: 10/07/2023

SHEET 1 OF 2

ITEMS: Lighting fixtures, lamps, receptacles, Junction boxes and Miscellaneous Items.

SCOPE:

Supply (Including Design) : YES

Erection & Commissioning : No

Services : YES (Supervision of E&C)

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

Notes:

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

<p>PREPARED BY <i>Devendra Singh</i> 10-07-23 11/07/23</p> <p>M S S RAJPAL/ DEVENDRA SINGH (MANAGER/ DY. MANAGER)</p>	<p>CHECKED BY <i>Megha</i> 13/07/23 <i>Kavita Gupta</i> 13/07/23</p> <p>MEGHA/ KAVITA GUPTA (MANAGER/ SR. MANAGER)</p>	<p>REVIEWED BY <i>Ayan Saha</i> 12.7.23 <i>Hema</i> 13/7/2023</p> <p>AYAN SAHA/ HEMA KUSHWAHA (DGM/SR. MANAGER)</p>	<p>APPROVED BY <i>Sandeep Lodh</i> 13/07/2023 <i>Praveen Dutta</i> 13/7/2023</p> <p>SANDEEP LODH/ PRAVEEN DUTTA (Sr. DGM/AGM)</p> <p>DEBASISA RATH AGM (DH- ELECT)</p>
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1594976/2023/PS-PEM-EL



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

4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD & 2 X 500 MW NTPC SIPAT FGD SYSTEM PACKAGE

DOC. NO. PE-PQ-481/491-558-E006

REV. 00

DATE: 10/07/2023

SHEET 2 OF 2

- 3. Bidder to note that MOU on non-judicial stamp paper once offered to BHEL cannot be changed till the execution of the project.

General Points of PQR:

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

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
<i>Devendra Singh</i> 10/07/23 11/07/23 M S S RAJPAL/ DEVENDRA SINGH (MANAGER/ DY. MANAGER)	<i>Megha</i> 10/07/23 <i>Kavita Gupta</i> 13/07/23 MEGHA/ KAVITA GUPTA (MANAGER/ SR. MANAGER)	<i>Ayan Saha</i> 12.7.23 <i>Hema Kushwaha</i> 13/7/23 AYAN SAHA/ HEMA KUSHWAHA (DGM/SR. MANAGER)	<i>Sandeep Lodh</i> 13/07/2023 <i>Debasisa Rath</i> 13/7/23 SANDEEP LODH/ PRAVEEN DUTTA (Sr. DGM/AGM) DEBASISA RATH AGM (DH- ELECT)

4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD

LIGHTING FIXTURES,LAMPS & MISC. ITEMS

BOQ cum Price Schedule (Main Supply)

ANNEXURE-I

SR. No.	ITEM CODE	ITEM DESCRIPTION	UOM	Quantity	Quote/Unquote	Freight in terms of total Ex-works price in %	GST rate in %
1.0	Lighting Luminaires (complete with accessories)						
1.01	558-12118-A	Luminaire Type FC06 (LED)	Nos.	1000			
1.02	558-12195-A	Luminaire Type FC07 (LED)-DC	Nos.	100			
1.03	558-12196-A	Luminaire Type FC33 (LED)-DC	Nos.	30			
1.04	558-12140-A	Luminaire Type FC30 (LED)	Nos.	250			
1.05	558-12120-A	Luminaire Type FC81 (LED)	Nos.	70			
1.06	558-12199-A	Luminaire Type SB02 (LED)	Nos.	15			
1.07	558-12200-A	Luminaire Type SB03 (LED)	Nos.	215			
1.08	558-12201-A	Luminaire Type SF63 (LED)	Nos.	40			
1.09	558-12122-A	Luminaire Type SS62 (LED)	Nos.	70			
1.1	558-12205-A	Luminaire Type SW41 (LED)	Nos.	500			
1.11	558-12206-A	Luminaire Type SW42 (LED)	Nos.	150			
2.0	Driver for Lighting Luminaires (complete with accessories)						
2.01	558-12231-A	DRIVER - LUMINAIRES TYPE FC06 (LED)	Nos.	50			
2.02	558-12233-A	DRIVER - LUMINAIRES TYPE FC81 (LED)	Nos.	4			
2.03	558-12235-A	DRIVER - LUMINAIRES TYPE FC07 (LED)	Nos.	5			
2.04	558-12236-A	DRIVER - LUMINAIRES TYPE FC33 (LED)	Nos.	2			
2.05	558-12238-A	DRIVER - LUMINAIRES TYPE SF63 (LED)	Nos.	2			
2.06	558-12242-A	DRIVER - LUMINAIRES TYPE SB02 (LED)	Nos.	1			
2.07	558-12243-A	DRIVER - LUMINAIRES TYPE SB03 (LED)	Nos.	11			
2.08	558-12244-A	DRIVER - LUMINAIRES TYPE SS62 (LED)	Nos.	4			
2.09	558-12246-A	DRIVER - LUMINAIRES TYPE SW41 (LED)	Nos.	25			
2.1	558-12247-A	DRIVER - LUMINAIRES TYPE SW42 (LED)	Nos.	8			
2.11	558-12250-A	DRIVER - LUMINAIRES TYPE FC30 (LED)	Nos.	13			
3.0	Switch boxes for individual control of circuits						
3.01	558-12087-A	Type SWB1	Nos.	100			
3.02	558-12088-A	Type SWB2	Nos.	40			
3.03	558-12089-A	Type SWB3	Nos.	10			
3.04	558-12099-A	Type SWB4	Nos.	20			
4.0	Junction boxes						
4.01	558-12026-A	Type JB-F	Nos.	2370			
4.02	558-12027-A	Type JB-FE	Nos.	70			
5.0	Receptacles						
5.01	558-12079-A	Type RA	Nos.	80			
5.02	558-12081-A	Type RB	Nos.	100			
5.03	558-12082-A	Type RC	Nos.	25			
6.0	Fans						
6.01	558-12094-A	Pedestal Fan	Nos.	5			
7.0	Emergency lighting Units						
7.01	558-12018-A	Emergency lighting Units With Lead-Acid/ Ni-Cd battery	Nos.	40			
8.0	Flexible conduit						
8.01	558-12253-A	Flexible TERENE coated conduit	Mtrs.	2440			
9.0	558-12019-A	EXIT SIGN	Nos.	60			

10.0	Ladder						
10.1	558-12091-A	Wheel mounted adjustable from 5M to 10M aluminium ladder	Nos.	1			
10.2	558-12022-A	Free standing adjustable from 5M to 10M aluminium ladder	Nos.	1			
Notes :							
1. Container as per Specification are to be supplied along with first supplies. The price of container is deemed to be included in package price. No separate charges shall be payable.							
2. The material shall be supplied in LOTS. LOTS shall be released progressively based on approved conduit layout of different areas and project requirement.							
3. Lighting system design charges are deemed to be included in the price of above items. No separate charges for design activity will be payable.							
4. For item at SI. No 1.0 above "Lighting Luminaires", the above quantity variation shall be calculated at the total order value against item at SI. No 1.0 (i.e. sum of order value of sub items 1.01 to 1.11)."							

4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD**LIGHTING FIXTURES,LAMPS & MISC. ITEMS****BOQ cum Price Schedule****(MANDATORY SPARES)****ANNEXURE-II**

SR. No.	Item code	ITEM DESCRIPTION	UOM	Quantity	Quote/Unquote	Freight in terms of total Ex-works price in %	GST rate in %
1.0	558-12000-B	Lighting Luminaires (complete with accessories)					
1.1	558-12000-B	Luminaire Type FC06 (LED)	Nos.	5			
1.1	558-12000-B	Luminaire Type FC07 (LED)-DC	Nos.	5			
1.2	558-12000-B	Luminaire Type FC33 (LED)-DC	Nos.	5			
1.3	558-12000-B	Luminaire Type FC30 (LED)	Nos.	5			
1.4	558-12000-B	Luminaire Type FC81 (LED)	Nos.	5			
1.5	558-12000-B	Luminaire Type SB02 (LED)	Nos.	5			
1.6	558-12000-B	Luminaire Type SB03 (LED)	Nos.	5			
1.7	558-12000-B	Luminaire Type SF63 (LED)	Nos.	5			
1.8	558-12000-B	Luminaire Type SS62 (LED)	Nos.	5			
1.9	558-12000-B	Luminaire Type SW41 (LED)	Nos.	5			
1.1	558-12000-B	Luminaire Type SW42 (LED)	Nos.	5			
2.0	558-12000-B	Junction Box- JB-F	Nos.	25			
3.0	558-12000-B	Receptacle Type RA	Nos.	10			

NOTE: Unit price for Mandatory spares items shall be same as that of Main supply Items.

4X210 MW + 3 X 500 MW NTPC KAHALGAON-FGD**LIGHTING FIXTURES,LAMPS & MISC. ITEMS****BOQ cum Price Schedule
(SUPERVISION OF ERECTION & COMMISSIONING)
ANNEXURE-III**

SR. No.	ITEM CODE	ITEM DESCRIPTION	UOM	Quantity	UNIT RATE(INR)	Remarks
1.0	558-12086-A	SUPERVISION OF ERECTION & COMMISSIONING				
1.01	558-12086-A	CHARGES PER VISIT	VISIT	4	20000	These are fixed charges will not be part of evaluation. Separate PO's as applicable (vendor/item wise) for SUPERVISION OF ERECTION & COMMISSIONING charges shall be placed outside GeM.
1.02	558-12086-A	MANDAYS CHARGES	DAYS	20	5000	

Notes :

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

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

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

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

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

2X500 MW NTPC SIPAT TPS, STAGE-II - FGD							
LIGHTING FIXTURES,LAMPS & MISC. ITEMS							
BOQ cum Price Schedule (Main Supply)							
ANNEXURE-I							
S.NO.	Item Code	DESCRIPTION	UNIT	QUANTITY	Quote/Unquote	Freight in terms of total Ex-	GST rate in %
		MAIN SUPPLY ITEMS					
1.0	Lighting Luminaires (complete with accessories)						
1.1	558-12118-A	Luminaire Type FC06 (LED)	Nos.	230			
1.2	558-12140-A	Luminaire Type FC30 (LED)	Nos.	90			
1.3	558-12120-A	Luminaire Type FC81 (LED)	Nos.	10			
1.4	558-12195-A	Luminaire Type FC07 (LED)	Nos.	28			
1.5	558-12196-A	Luminaire Type FC33 (LED)	Nos.	8			
1.6	558-12201-A	Luminaire Type SF63 (LED)	Nos.	12			
1.7	558-12199-A	Luminaire Type SB02 (LED)	Nos.	20			
1.8	558-12200-A	Luminaire Type SB03 (LED)	Nos.	42			
1.9	558-12122-A	Luminaire Type SS62 (LED)	Nos.	58			
1.10	558-12205-A	Luminaire Type SW41 (LED)	Nos.	280			
1.11	558-12206-A	Luminaire Type SW42 (LED)	Nos.	70			
2.0	Driver for lighting Luminaires						
2.1	558-12231-A	Luminaire Type FC06 (LED)	Nos.	12			
2.2	558-12250-A	Luminaire Type FC30 (LED)	Nos.	5			
2.3	558-12233-A	Luminaire Type FC81 (LED)	Nos.	1			
2.4	558-12235-A	Luminaire Type FC07 (LED)	Nos.	2			
2.5	558-12236-A	Luminaire Type FC33 (LED)	Nos.	1			
2.6	558-12238-A	Luminaire Type SF63 (LED)	Nos.	1			
2.7	558-12242-A	Luminaire Type SB02 (LED)	Nos.	1			
2.8	558-12243-A	Luminaire Type SB03 (LED)	Nos.	3			
2.9	558-12244-A	Luminaire Type SS62 (LED)	Nos.	3			
2.10	558-12246-A	Luminaire Type SW41 (LED)	Nos.	14			
2.11	558-12247-A	Luminaire Type SW42 (LED)	Nos.	4			
3.0	Switch boxes for individual control of circuits						
	Switchboards consisting of switch boxes, switches, switch plates and fixing accessories.						
3.1	558-12087-A	Type SWB1	Nos.	10			
3.2	558-12088-A	Type SWB2	Nos.	4			
3.3	558-12089-A	Type SWB3	Nos.	2			
3.4	558-12099-A	Type SWB4	Nos.	4			
4.0	Junction boxes						
4.1	558-12026-A	Type JB-F	Nos.	838			
4.2	558-12027-A	Type JB-FE	Nos.	10			
5.0	Receptacles						
5.1	558-12079-A	Type RA	Nos.	31			
5.2	558-12081-A	Type RB	Nos.	21			
5.3	558-12082-A	Type RC	Nos.	16			
6.0	Pedestal Fans						
6.1	558-12094-A	Pedestal Fans	Nos.	5			
7.0	Emergency lighting Units						
7.1	558-12018-A	Emergency lighting Units	Nos.	5			
8.0	Flexible TERNE coated conduit						
8.1	558-12253-A	TERNE coated conduit	mtrs.	1,380			

9.0	Ladder					
9.1	558-12022-A	Free standing ladder	Nos.	1		
9.2	558-12091-A	Wheel mounted ladder	Nos.	1		
10	558-12019-A	EXIT SIGN	Nos.	6		
NOTES						
1	CONTAINERS AS PER SPECIFICATION ARE TO BE SUPPLIED ALONG WITH FIRST SUPPLIES. THE PRICE OF CONTAINER IS DEEMED TO BE INCLUDED IN PACKAGE PRICE. NO SEPARATE CHARGES SHALL BE PAYABLE.					
2	THE MATERIAL SHALL BE SUPPLIED IN LOTS. LOTS SHALL BE RELEASED PROGRESSIVELY BASED ON APPROVED CONDUIT LAYOUT DRAWINGS OF DIFFERENT AREAS AND PROJECT REQUIREMENT.					
3	LIGHTING SYSTEM DESIGN CHARGES ARE DEEMED TO BE INCLUDED IN THE PRICE OF ABOVE ITEMS. NO SEPARATE CHARGES FOR DESIGN ACTIVITY WILL BE PAYABLE.					
4	TYPE TESTS CHARGES ARE DEEMED TO BE INCLUDED IN THE PRICE OF ABOVE ITEMS. NO SEPARATE CHARGES FOR TYPE TESTING WILL BE PAYABLE.					

2X500 MW NTPC SIPAT TPS, STAGE-II - FGD
LIGHTING FIXTURES,LAMPS & MISC. ITEMS
BOQ cum Price Schedule
(MANDATORY SPARES)
ANNEXURE-II

Item No.	ITEM CODE	DESCRIPTION	UNIT	QUANTITY	Quote/Unquote	Freight in terms of total Ex-works price in %	GST rate in %
		MAIN SUPPLY ITEMS					
1.0	558-12000-B	Lighting Luminaires (complete with accessories)					
1.1	558-12000-B	Luminaire Type FC06 (LED)	Nos.	5			
1.2	558-12000-B	Luminaire Type FC30 (LED)	Nos.	5			
1.3	558-12000-B	Luminaire Type FC81 (LED)	Nos.	5			
1.4	558-12000-B	Luminaire Type FC07 (LED)	Nos.	5			
1.5	558-12000-B	Luminaire Type FC33 (LED)	Nos.	5			
1.6	558-12000-B	Luminaire Type SF63 (LED)	Nos.	5			
1.7	558-12000-B	Luminaire Type SB02 (LED)	Nos.	5			
1.8	558-12000-B	Luminaire Type SB03 (LED)	Nos.	5			
1.9	558-12000-B	Luminaire Type SS62 (LED)	Nos.	5			
1.10	558-12000-B	Luminaire Type SW41 (LED)	Nos.	5			
1.11	558-12000-B	Luminaire Type SW42 (LED)	Nos.	5			
2.0	558-12000-B	Junction boxes					
2.1	558-12000-B	Type JB-F	Nos.	25			
3.0	558-12000-B	Receptacles					
3.1	558-12000-B	Type RA	Nos.	10			

NOTE: Unit price for Mandatory spares items shall be same as that of Main supply Items.

**2X500 MW NTPC SIPAT TPS, STAGE-II - FGD
LIGHTING FIXTURES,LAMPS & MISC. ITEMS
BOQ cum Price Schedule
(SUPERVISION OF ERECTION & COMMISSIONING)
ANNEXURE-III**

SR. No.	ITEM CODE	ITEM DESCRIPTION	UOM	Quantity	UNIT RATE(INR)	Remarks
1.0		SUPERVISION OF ERECTION & COMMISSIONING				
1.01	558-12191-A	CHARGES PER VISIT	VISIT	2	20000	These are fixed charges will not be part of evaluation. Separate PO's as applicable (vendor/item wise) for SUPERVISION OF ERECTION & COMMISSIONING charges shall be placed outside GeM.
1.02	558-12192-A	MANDAYS CHARGES	DAYS	10	5000	

Notes :

1. FOR SUPERVISION OF E&C, 2 (TWO) VISITS AND 10 (TEN) MANDAYS TO BE CONSIDERED. THE PRICES SHALL BE INCLUSIVE OF CHARGES OF AIRFARE (TO & FRO), BOARDING, LODGING, VISA, MEDICAL, INSURANCE ETC.

2. AMOUNT PAYABLE PER VISIT = VISIT CHARGES AS PER SL. NO. 1.01 ABOVE (+) UNIT PRICE FOR MANDAYS CHARGES AS PER SL. NO. 1.02 ABOVE (x) NO. OF MANDAYS AT SITE (TO BE CERTIFIED BY BHEL SITE)

3. UNIT RATE FOR 1.01 AND 1.02 ARE INR 20000/- AND INR 5000/- RESPECTIVELY AND SAME IS FIRM. SUPERVISION OF E&C RATE SHALL NOT BE CONSIDERED FOR PRICE EVALUTION.

4. NOS. OF VISIT FOR SUPERVISION OF E&C MAY INCREASE BASED ON PROJECT REQUIREMENT.

i.	Item/Scope of Sub-contracting उप-संविदा(अनुबंध) का मद/ दायरा	
ii.	Address of the registered office पंजीकृत कार्यालय का पता	Details of Contact Person संपर्क व्यक्ति का विवरण (Name, Designation, Mobile, Email) (नाम, पदनाम, मोबाइल, ईमेल)
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured प्रस्तावित उप-विक्रेता के कार्यों का नाम और पता, जहां मद का निर्माण किया जा रहा है	Details of Contact Person: संपर्क व्यक्ति का विवरण (Name, Designation, Mobile, Email) (नाम, पदनाम, मोबाइल, ईमेल)
iv.	Annual Production Capacity for proposed item/scope of sub-contracting उप-संविदा(अनुबंध) के प्रस्तावित मद / दायरे के लिए वार्षिक उत्पादन क्षमता	
v.	Annual production for last 3 years for proposed item/scope of sub-contracting उप-संविदा(अनुबंध) के प्रस्तावित मद / दायरे के लिए पिछले 3 वर्षों का वार्षिक उत्पादन	
vi.	Details of proposed works प्रस्तावित कार्यों का विवरण	
1.	Year of establishment of present works वर्तमान फैक्टरी की स्थापना का वर्ष	
2.	Year of commencement of manufacturing at above works उपरोक्त फैक्टरी में निर्माण कार्य शुरू होने का वर्ष	
3.	Details of change in Works address in past (if any) पूर्व में फैक्टरी स्थल में परिवर्तन का विवरण (यदि कोई हो)	
4.	Total Area कुल क्षेत्र	
	Covered Area शामिल क्षेत्र	
5.	Factory Registration Certificate फैक्टरी पंजीकरण प्रमाण पत्र	Details attached at Annexure – F2.1 विवरण अनुलग्नक- एफ 2.1 पर संलग्न है
6.	Design/ Research & development set-up डिजाइन / अनुसंधान और विकास सेटअप (No. of manpower, their qualification, machines & tools employed etc.) (श्रमिकों की संख्या, उनकी योग्यता, मशीन और उपलब्ध उपकरण आदि)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design Details attached at Annexure – F2.2 (if applicable) लागू / लागू नहीं, अगर विनिर्माण मुख्य संविदाकार / खरीददार के डिजाइन के अनुसार है) विवरण अनुलग्नक –एफ 2.2 पर संलग्न है । (यदि लागू हो)
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc) मैनपावर विवरण के साथ समग्र संगठन का चार्ट(डिजाइन / विनिर्माण / गुणवत्ता आदि)	Details attached at Annexure – F2.3 विवरण अनुलग्नक – F2.3 में संलग्न है ।
8.	After sales service set up in India, in case of foreign sub-vendor(Location, Contact Person, Contact details etc.) भारत	Applicable / Not applicable लागू / लागू नहीं

	में बिक्री सेवा की स्थापना के बाद, विदेशी उप-विक्रेता के मामले में(स्थल , संपर्क व्यक्ति, संपर्क विवरण आदि)	<i>Details attached at Annexure – F2.4</i> विवरण अनुलग्नक -2.4 पर संलग्न है ।			
9.	<i>Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any</i> फ्लोचार्ट सहित विनिर्माण प्रक्रिया निष्पादन योजना , जिसमें आउटसोर्स प्रक्रिया, यदि कोई हो, सहित कच्चे माल से तैयार उत्पाद तक विनिर्माण के विभिन्न चरणों को दर्शाया गया हो,	<i>Details attached at Annexure – F2.5</i> विवरण अनुलग्नक - F2.5में संलग्न है ।			
10.	<i>Sources of Raw Material/Major Bought Out Item</i> कच्चे माल के स्रोत / खरीदे हुए मुख्य मद	<i>Details attached at Annexure – F2.6</i> विवरण अनुलग्नक - F2.6में संलग्न है ।			
11.	<i>Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing</i> कच्चे माल / खरीदे हुए मद, प्रक्रियाबद्ध, अंतिम परीक्षण, पैकिंग करते समय गुणवत्ता नियंत्रण	<i>Details attached at Annexure – F2.7</i> विवरण अनुलग्नक - F2.7 पर संलग्न है			
12.	<i>Manufacturing facilities (List of machines, special process facilities, material handling etc.)</i> विनिर्माण सुविधा(मशीनों की सूची , विशेष प्रक्रिया सुविधाएं, सामग्री रख-रखाव आदि)	<i>Details attached at Annexure – F2.8</i> विवरण अनुलग्नक - F2.8में संलग्न है ।			
13.	<i>Testing facilities (List of testing equipment)</i> परीक्षण सुविधाएं(परीक्षण उपकरण की सूची)	<i>Details attached at Annexure – F2.9</i> विवरण अनुलग्नक – F2. 9 में संलग्न है ।			
14.	<i>If manufacturing process involves fabrication then-</i> यदि निर्माण प्रक्रिया में फेब्रिकेशन की गई है तो- <i>List of qualified Welders</i> पात्र वेल्डर की सूची <i>List of qualified NDT personnel with area of specialization</i> विशेषज्ञता के क्षेत्र सहित पात्र एनडीटी कार्मिकों की सूची	<i>Applicable / Not applicable</i> लागू/ लागू नहीं <i>Details attached at Annexure – F2.10</i> विवरण अनुलग्नक - F2.10में संलग्न है। <i>(if applicable)</i> लागू/ लागू नहीं			
15.	<i>List of out-sourced manufacturing processes with Sub-Vendors’ names & addresses</i> सब-वेंडर द्वारा बाह्य स्रोतों (उनके नाम और पते सहित)से करवाएं गए निर्माण प्रक्रियाओं की सूची	<i>Applicable / Not applicable</i> लागू/ लागू नहीं <i>Details attached at Annexure. –F2.11</i> विवरण अनुलग्नक - F2.10में संलग्न है। <i>(if applicable)</i> (यदि लागू हो)			
16.	<i>Supply reference list including recent supplies</i> नवीनतम आपूर्ति सहित आपूर्ति संदर्भ सूची	<i>Details attached at Annexure – F2.12</i> विवरण अनुलग्नक - F2.12 में संलग्न है । <i>(as per format given below)</i> (नीचे दिए गए प्रारूप के अनुसार)			
<i>Project/ package</i> परियोजना /पैकेज	<i>Customer Name</i> ग्राहक का नाम	<i>Supplied Item (Type/Rating/Model /Capacity/Size etc)</i> आपूर्ति की गई वस्तु (प्रकार / रेटिंग / मॉडल / क्षमता / आकार आदि)	<i>PO ref no/date</i> पीओ संदर्भ सं. / तिथि	<i>Supplied Quantity</i> आपूर्ति की मात्रा	<i>Date of Supply</i> आपूर्ति की तारीख
17.	<i>Product satisfactory performance feedback letter/certificates/End User Feedback</i> उत्पाद के संतोषजनक प्रदर्शन संबंधी फीडबैक पत्र / प्रमाण पत्र / अंतिम उपयोगकर्ता फीडबैक		<i>Attached at annexure - F2.13</i> अनुलग्नक F2. 3पर संलग्न है		
18.	<i>Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product</i>		<i>Applicable / Not applicable</i> लागू/ लागू नहीं		

**CORPORATE QUALITY ASSURANCE/ कॉर्पोरेट गुणवत्ता आश्वासन****SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली**

	<i>(similar or higher rating)</i> प्रस्तावित उत्पाद (एक समान या उच्च रेटिंग वाले) के लिए टाइप टेस्ट रिपोर्ट (टाइप टेस्ट विवरण, रिपोर्ट संख्या, एजेंसी, जांच की तारीख) का सारांश नोट: - रिपोर्ट प्रस्तुत करने की आवश्यकता नहीं है <i>Note:- Reports need not to be submitted</i>	<i>Details attached at Annexure – F2.14</i> विवरण अनुलग्नक - F2.1 4में संलग्न है <i>(if applicable)</i> (यदि लागू हो)	
19.	<i>Statutory / mandatory certification for the proposed product</i> प्रस्तावित उत्पाद के लिए वैधानिक / अनिवार्य प्रमाणीकरण	<i>Applicable / Not applicable</i> लागू / लागू नहीं <i>Details attached at Annexure – F2.15</i> <i>(if applicable)</i> (यदि लागू हो)	
20.	<i>Copy of ISO 9001 certificate</i> आईएसओ 9001 प्रमाण पत्र की प्रति <i>(if available)</i> (यदि उपलब्ध हो)	<i>Attached at Annexure – F2.16</i> अनुलग्नक में संलग्न - F2.1 6 है	
21.	<i>Product technical catalogues for proposed item (if available)</i> प्रस्तावित मद के लिए उत्पाद तकनीकी कैटलॉग (यदि उपलब्ध हो)	<i>Details attached at Annexure – F2.17</i> विवरण अनुलग्नक - F2.1 7 में संलग्न है	
<i>Name:</i> नाम:	<i>Desig:</i> पद:	<i>Sign:</i> हस्ता क्षर:	<i>Date:</i> तिथि:

Company's Seal/Stamp:- कंपनी की मुहर/ मोहर:-