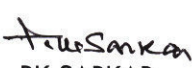
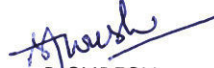


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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. TECHNICAL SPECIFICATION FOR ILLUMINATION ITEMS PACKAGE PROJECT : 65MWp SOLAR POWER PLANT CUSTOMER : NLC – NEYVELY (TN).						
Ref. Doc	Revisions Refer to record of revisions	Prepared  PK SARKAR	Checked  SHADAB AHMED	Approved  P SURESH	Date 29-08-2016	

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		deviations are proposed by Bidder and subsequently withdrawn, no commercial implications can be claimed by the bidder. If any deviation is accepted by BHEL during technical evaluation then also there will be no price implication. Hence, in no case there will be consideration of Price implications. 5. Bidder shall submit duly filled, stamped & signed deviation schedule as per attached format (Annexure-V) along with technical offer. If there are no deviations from the specifications, bidder still has to submit the Deviation schedule by writing “NO Deviations” in this format. If the “Deviation format” is not submitted along with the offer, or submitted without sign & stamp, the bidder’s offer is likely to be rejected without any further interaction with the bidder. 6. Bidders are advised to quote model and brand of all standard make items, manufactured by reputed makers or vendors from sub vendor list (Annexure-IV). Offer shall include supporting Catalogue/published literature (Duly highlighting the appropriate variant). In case of discrepancy between Bidder’s offer and published documents, details furnished in published documents/catalogues will be taken into consideration for technical evaluation. 7. In the event of any conflicts between these specification, related standards, data sheets, codes, etc. vendor shall refer the matter to BHEL for clarification and only after obtaining the clarification, vendor shall proceed with the manufacture of the items in question. 8. Bidder shall be responsible for providing all items specified at Part-A (Main Illumination Package) & Part-B (Mandatory spare) of the Illumination BOM, attached as Annexure-II. Incomplete Offer for illumination items listed in BOM will not be considered for evaluation and offer will likely be rejected without any communication. 9. All materials shall be as per sub vendor list attached as Annexure-IV. Any deviation in this regard will not be acceptable. Any item or accessories which are not covered in the sub vendor list shall be of reputed make of proven track record and manufactured in accordance with various national and international standards. 10. Bidder to submit duly signed & stamped un-priced price schedule filled in writing “Quoted” against each item as per attached format (Annexure-III) along with technical offer as a token of his concurrence that all items were quoted along with unit prices. If not submitted in this format or any field is left blank, the offer will be liable for rejection. For discrepancies, if any, in the bid with respect to Quantity, Rates & Totals, etc., BHEL discretion shall be applicable. 11. Vendor shall fill up prices of various items and submit to BHEL in separate sealed cover as part of commercial offer. The commercial bid shall be submitted as per commercial terms and conditions. 12. The quantities given in Illumination BOM (Annexure-II) may vary to the extent of +/-10% as per various finalized illumination layouts based on Customer approval. Same shall be informed to bidder at the time of technical scrutiny. For addition/reduction of quantity, unit rate quoted in the present offer shall be considered. 13. Bidder to submit duly stamped and signed “Bidder Check list” as per prescribed format (Annexure-VI) as confirmation for compliance to various technical and documentation requirements associated with the offer. Bidder to fill in writing “Yes” in the indicated column against each row of table mentioned in the Check list. Technical offer submitted without filled in Check list will not be considered for evaluation. Also if any row of		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		submitted check list is left blank or not confirmed or the check list is submitted without bidder's sign and stamp, the offer will be rejected without any communication. 14. In case of any discrepancy between Illumination BOM (Annexure-II) and Technical specification as per clause D below, Illumination BOM (Annexure-II) is to be followed. D. <u>TECHNICAL SPECIFICATIONS:</u> SITE CONDITIONS: For Site conditions of Project Refer Annexure-II (Illumination BOM). Bidder shall supply all materials suitable for satisfactory working in the mentioned site conditions. I. SAFE AREA FIXTURES AND LAMPS: 1.1 All fixtures, lamps and accessories shall be designed for continuous operation for its life under atmospheric conditions existing at site and without exceeding permissible temperature rise as specified in the applicable standards. 1.2 LED fixtures shall be manufactured and tested in conformity with code & standard as specified at clause-2.0 of 'B' above. 1.3 Unless specified otherwise, operating voltage is 240V±10% 1-phase 50Hz±5% AC. All fixtures shall be suitable for operation on available power supply. 1.4 All Lighting fixtures shall be complete with lamp(s), lamp holder(s), LED chip assembly, terminal blocks, clamps, locking arrangements, fixing brackets, metal reflector etc. 1.5 Driver circuit/Control gears shall be provided as applicable / specified. The fixtures shall be fully wired upto terminal block. 1.6 The lamp fittings shall be covered by Glass or Perspex material. 1.7 All lighting fixtures shall be provided with an external, brass/GI earthing terminal suitable for connecting 14SWG, GI earthing wire. All metal or metal enclosed parts of the housing and accessories shall be bonded and connected to earthing terminal. 1.8 The lighting fixtures shall be designed for minimum glare. The finish of the fixtures shall be such that no bright spot are produced either by direct source or by reflection. 1.9 The reflector shall be manufactured from CRCA sheet steel or aluminum. Aluminum reflector shall be made of high purity aluminum sheet, polished electrochemically brightened and anodized or proven alternate arrangements of anodizing. 1.10 All street lighting & Flood lighting fixtures shall be weather proof with IP 55 (min) protection. Street Lighting fixtures shall be fitted with an electrochemically brightened anodized aluminum reflector for excellent light control with high optic efficiency and shall be suitable for mounting with steel pipe. 1.11 LED luminaires body shall have heat sink / heat dissipating housing. 1.12 LED luminaires housing/body shall be pressure die cast aluminum or extruded aluminum or CRCA as specified along with finished powder coating. Design shall be such that there is no water stagnation anywhere. 1.13 LED type of fixtures shall meet the following technical requirements:- a) The LED luminaires shall have minimum life of 25,000 burning hours with 80% of Lumen maintenance at the end of the life. b) LED luminaires shall have suitable beam angle to deliver better lumen output. c) The THD of LED luminaire shall be less than 10% and EMC shall be as per IS14700. d) The power factor of the luminaire shall not be less than 0.9. e) LED modules and drivers shall be compatible to each other. LED drivers may have necessary suitable precision current control and protection of LED.		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	1.14 Fixture catalogue details /name plate as per E-I of this specification shall be provided for easy identification. 1.15 All necessary test certificates from qualified agency in support of the technical requirement should be produced during approval of drawings and inspection or whenever asked. Following test reports to be submitted for LED Chip/ LED Luminaires: i) LED Parameters like lumen per watt, CRI, Beam angle. ii) LM 80/IS:16105 report iii)LM79/IS:16106 repot II. SAFE AREA WEATHER PROOF JUNCTION BOXES: 1.1 The safe area weather proof junction boxes shall have IP55 degree of protection and shall be weather proof. 1.2 Enclosure of rectangular JB's shall be of material (i.e. FRP/sheet steel/cast Iron/Die cast Aluminium/Thermoplastic) as per mentioned in the Illumination BOM(Annexure-II). Also JB's shall be epoxy painted with shade of RAL 7032 /631/632 as per IS 5 (shall be finalized during detail engineering) if not otherwise specified & minimum paint thickness shall be 75 micron. 1.3 Size of the JB shall be project specific as indicated in annexure-II (Illumination BOM). The internal and external surface shall have smooth finish, completely free from dents, defects and blow holes. All screws / hinges shall be of stainless steel and all hardware provided shall be MS Cadmium plated/zinc passivated. 1.4 JB shall have cable entries from bottom only to protect from heavy tropical rains. 1.5 Clamp type Terminal blocks of rating & qty. as indicated in the project illumination BOQ shall be provided. There should be sufficient space between bottom of Terminal Block and Top of Cable gland for easy termination of wires. Required no. of lugs shall be supplied in loose for cable termination. 1.6 The no. of entries required and their sizes shall be project specific as indicated in the illumination BOM. 4 Nos. of cable glands of required sizes suitable for cable entries shall be supplied in loose. Cable glands and lugs shall be as per Clause no. D-IX of the specification. 1.7 One blanking plug for each type of cable entry shall be provided. In addition, all the entries should be plugged with PVC plugs before dispatch. 1.8 Doors shall be screwed / bolted as per manufacturer's design and enclosure should have neoprene gasket. 1.9 JB should be suitable for Wall/Column mounting and mounting lugs shall be provided in the enclosure. Necessary mounting hardware/Mounting bracket shall be provided in loose. 1.10 JB's shall be provided with earthing studs (2 nos. internal and 2 nos. external) with washers. 1.11 Inscription plate / nameplate as per E.II of this specification with caution note shall be provided on front cover. 1.12 All necessary test certificates from qualified agency in support of the technical requirement should be produced during approval of drawings and inspection or whenever asked. III. 20A, 240V, 2-POLE, 3-PIN, INDUSTRIAL WEATHERPROOF METAL CLAD PLUG SOCKET : 1.1 Receptacles shall be dustproof/vermin proof with metal clad gasketted construction conform to IS 1293 and shall be weather proof with IP 55(Min.) degree of protection.		
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	1.3	Receptacles enclosure shall be CRCA sheet steel with epoxy powder coating after galvanization and paint shade of RAL 7032 /631/632 as per IS 5 (shall be finalized during detail engineering) if not otherwise specified & minimum paint thickness shall be 75 micron.
	1.4	Outdoor type of receptacle shall have external FRP/sheet steel canopy or rain hood to protect from heavy tropical rain.
	1.6	Receptacles shall be suitable for wall / column mounting. All mounting hardware shall be supplied along with receptacles.
	1.7	Front cover with neoprene gasket shall be screwed to the fabricated box by cadmium plated brass screws & cup washers. This box shall have outlets at the bottom for incoming and outgoing cables.
	1.8.	Receptacle box shall be provided with internal and external earthing screws with washer and nuts for grounding.
	1.6	Receptacle shall be supplied with suitable plug. The plug assembly shall be mechanically rugged, light and shall not unduly stress the socket or its own pins when fitted on the socket. Earth pin of the plug shall first engage with pin of socket / receptacle.
	1.7	Rail mounted terminal block suitable for 6 sq mm wire or rated for 30A shall be supplied with tined Cu lugs for all outgoing and incoming cables with loop in and loop out facility.
	1.8	All internal power wiring shall be done with 660V grade PVC insulated Cu wires of 4sqmm cu. wire.
	1.9	Each outlet shall be provided with either a spring loaded hinged cover or a cap connected metallic chain to close the outlet when not in service.
	1.10	Each socket shall have two cable entries for looping facility and supplied with two numbers of suitable weather proof cable glands and one number sealing plug to seal the unused cable entry. Necessary suitable cable gland & Al. blanking plug shall be supplied with each socket. The sizes of cable entries & Cable glands shall be project specific as indicated in the illumination BOM or will be decided during drawing approval stage. Lugs shall be supplied for termination of cables. Cable glands & Lugs shall be as per Clause no. D-IX of the specification.
	1.11	Inscription plate/Name plate shall be provided indicating voltage rating of the socket as per clause E-III of this specification.
	1.12	Makes of major components shall be as follows if not otherwise specified in the sub vendor list: (i) MCBs: MDS, Havell’s, Indo-Asian, Legrand, ABB, Schneider.
	1.13	All necessary test certificates from qualified agency in support of the technical requirement should be produced during approval of drawings and inspection or whenever asked.

Ref. Doc	IV.	63A, 415V, 3-PHASE, 5-PIN WELDING RECEPTACLE WITH PLUG (SAFE AREA):
	1.1	Receptacles shall be dust proof / vermin proof metal clad gasketed construction and shall be weatherproof with IP 55 degree of protection. Outdoor type socket shall be provided with external canopy or rain hood to protect from tropical rain.
	1.2	Receptacles enclosure shall be CRCA sheet steel and painted with epoxy powder coated. Paint thickness shall be minimum 75 micron and paint shade of RAL 7032 /631/632 as per IS 5 (shall be finalized during detail engineering) if not otherwise specified.
	1.3	Receptacle shall be provided with 5-pin (3P+1N+1E) socket & Plug non reversible type.

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		1.4 The socket outlet shall be provided with interlocking switch such that it cannot be switched ON unless plug is fully inserted and Plug cannot be withdrawn when switch is ON. 1.5 Receptacles shall be suitable for wall / column mounting. All mounting hardware shall be supplied along with receptacles. Receptacle box shall be provided with internal & external earthing stud with washer & nuts welded on the surface for grounding. 1.6 The plug assembly shall be mechanically rugged, light and shall not unduly stress the socket or its own pins when fitted on the socket. 1.7 In order to prevent accidental removal of plug from socket, the engagement and disengagement shall be by two separate and distinct movements and positions. 1.8 Stud type terminals rated for 100A (50sqmm) along with tinned Cu. lugs shall be provided for all outgoing and incoming cables. 1.9 All internal power wiring shall be done with 16sqmm Cu. wire of 660V grade PVC insulated. 1.10 Each outlet shall be provided with either a spring loaded hinged cover or a cap connected metallic chain to close the outlet when not in service. 1.11 Each socket shall have two cable entries of 4C x 35 sq mm Al. XLPE Cable (if not specified) with looping facility along with two numbers of weather proof cable glands and one number sealing plug to seal the unused cable entry. Cable glands and Lugs shall be as per Clause no. D-IX of the specification. 1.12 Inscription plate / name plate shall be provided indicating tag no. of receptacle and voltage rating as per clause E-III of this spec. 1.13 Receptacle Boxes shall be supplied complete in all respect with all internal accessories like Socket, Switch, TBs etc. Other accessories like mounting hardware, Cable Glands, Cu. Lugs, Al. blanking plug shall be supplied in loose. 1.14 All necessary test certificates from qualified agency in support of the technical requirement should be produced during approval of drawings and inspection or whenever asked. V. SURFACE MOUNTED SWITCHBOARD (SSB): 1.1 All switchboards shall be of modular construction with piano type switches/Socket etc. flush mounted on front cover. Color of the front cover and switches shall be milky white. 1.2 Switchboard shall be surface mounted type complete with surface box, cover, switches & sockets. 1.3 Rating and No. of switches shall be as specified in the Illumination BOM (Annexure-1). Additionally sockets may also provide on the switch board if specified in the Illumination BOM. 1.4 Conduit knockouts shall be provided on each switchboard suitable for 25mm diameter conduit entry. 1.5 Switchboards shall be provided with earthing screw and washer for body earthing. 1.6 Makes of switchboard & switches shall be of reputed make like Anchor, Cona Electrical Solutions, ABB, Schneider etc if not otherwise specified in the sub vendor list. VI. CABLE CLAMPS : 1.1 Cable clamps and base shall be provided of size as mentioned in Annexure-II (Illumination BOM) to suit the cable size as specified. 1.2 Cable clamps shall be of 1.6mm thick GI and base shall be of GI with 3mm thickness and required width. 1.3 All hardware including clamp base mounting screw and cable clamp mounting end screws, shall be provided along with each Cable clamp. All hardware shall be galvanized or zinc passivated.		
	Ref. Doc			

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VII. STREET & FLOOD LIGHTING POLES (7.5m, 8.0m, 9.5m, 10.0m, 11.0m & 12.0m):

1.1

Lighting poles shall conform to IS 2713-1980.

1.2

Lighting poles shall be swaged & welded steel poles from tubes confirming to Yst 240 or Yst 310 of IS-1161. The poles shall confirm to following types:

7.5 m pole

-

410 SP-8

8.0 m pole

-

410 SP-15

9.5 m pole

-

410 SP-38

10.0 m pole

-

410 SP-42

11.0 m pole

-

410 SP-54

12.0 m pole

-

410 SP-58

1.3

The pole shall be coated with bituminous compound paint internally and externally up to the level which goes inside the earth. Exposed surface shall be coated with one coat of red oxide primer & finished with two coats of aluminum paint.

1.4

The pole shall have anti corrosive coating at threaded portion..

1.5

The lighting pole shall be completed with fixing base plate for mounting of pole in concrete foundation.

1.6

Poles shall be supplied with Fixing brackets, weather proof marshalling box or Junction box, 50/100 dia bend pipe & all other accessories as shown in the drawings(Annexure-1).

1.7

The marshalling box/Junction box to be supplied with Poles shall have IP 55 degree of protection provided with hinged door & suitable locking arrangements. This box shall be of 250x160x90mm (min.) size and contain cable entries with cable gland, Fuse, neutral links, terminal blocks, ground studs, etc as indicated in the drawing. Marshalling box/JB shall be deep drawn or fabricated made of 1.6mm thick CRCA sheet and hot dip galvanized. Lugs shall be supplied for termination of cables. Cable glands & Lugs shall be as per Clause no. D-IX of the specification.

1.8

Street lighting pole shall have either swan neck arrangement or straight pipe on the top as shown in the drawing(Annexure-I).

1.9

Flood lighting poles should have fixture mounting ISMC on top of pole as indicated in the drawing(Annexure-I).

1.10

All poles should have required size holes at indicated location as shown in the drawing for routing of cable to the fixture.

1.12

Inscription plate / name plate for Marshalling box shall be provided indicating tag no. and voltage rating as per clause E-II of this specification.

1.13

All necessary test certificates from qualified agency in support of the technical requirement should be produced during approval of drawings and inspection or whenever asked.

VIII. LIGHTING POLES (2.2m & 4.2m):

1.1

Lighting pole shall be of medium grade GI pipe with diameter & height as specified in the Drawing (Annexure-1).

1.2

Construction and other required accessories shall be as per drawing (Annexure-I) attached with this document.

1.3

The poles shall be hot dip galvanized as per relevant IS2629/IS2633/IS4759. The average coating thickness of galvanizing shall be min. 70 micron.

1.4

The pole shall have anti corrosive coating at threaded portion.

Ref. Doc

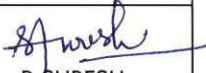
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		1.5 The lighting pole shall be completed with fixing base plate for mounting of pole in concrete foundation. 1.6 Poles shall be supplied with Fixing brackets, weather proof marshalling box or Junction box, 50/100 dia bend pipe & all other accessories as shown in the drawings(Annexure-1). 1.7 The marshalling box to be supplied with Poles shall have IP 55 degree of protection provided with hinged door & suitable locking arrangements. This box shall be of 250x160x90mm (min.) size and contain cable entries with cable gland, Fuse, neutral links, terminal blocks, ground studs, etc. Marshalling box shall be deep drawn or fabricated made of 1.6mm thick CRCA sheet and hot dip galvanized. Lugs shall be supplied for termination of cables. Cable glands & Lugs shall be as per Clause no. D-IX of the specification. 1.8 Lighting pole shall have either swan neck arrangement or straight pipe on the top as shown in the drawing (Annexure-I). 1.9 All poles should have required size holes at indicated location as shown in the drawing for routing of cable to the fixture. 1.10 Inscription plate / name plate for Marshalling box shall be provided indicating tag no. and voltage rating as per clause E-II of this specification. 1.11 All necessary test certificates from qualified agency in support of the technical requirement should be produced during approval of drawings and inspection or whenever asked. IX. CABLE GLANDS & LUGS: 1.1 Cable glands for termination of cable shall be made of Double compression type Nickel plated brass. The glands for armoured cables shall have provision for earthing of cable armoring. All glands shall be fitted with suitable compression or packing ring to protect the same from ingress of water and moisture. All glands shall be provided with locking nut, earth tag and PVC cable shoe/shroud. PVC insulated earth continuity conductors of appropriate size in conformity with Indian Electricity Rules shall be supplied to connect all earth tags to the main earth bars at terminations of cables. 1.2 The compression type cable lugs shall be used for terminations. All lugs shall be tinned copper heavy duty type. E. <u>MARKING AND IDENTIFICATION:</u> I. Fixture : Each fixture shall have marking with details like manufacturer name, Model no., applicable voltage and lamp wattage, applicable classified area (IP Class & Hazardous area classification with Certificate No. & Date with name of certifying agency, if applicable) etc. II. Junction Box/Marshalling Box Name Plate: Each junction box/Marshalling Box shall have name plate fixed firmly on the front cover with details as per manufacturer standard. However minimum following details shall be provided in the name plate: - Manufacturer's name & Model No. - Material code - Enclosure classification for flame proof JB (Certificate No. & Date with name of certifying agency) III. Power Socket Name Plate: Each 1ph/3ph socket shall have a name plate with details as per manufacturer standard. However minimum following details shall be provided in the name plate. - Manufacturer's name & Model No.		
	Ref. Doc			

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	b) Complete Description of socket with mention of applicable classified area (i.e. Indoor/ Outdoor /Hazardous Classification etc.). c) No. of phase & Voltage rating (i.e. 1ph or 3 ph, 24V/230V/415V) F. <u>PACKING INSTRUCTION</u> a) Vendor is advised to include packing details in the datasheet of the item and obtain approval of the same from BHEL. All item must be packed as per approved datasheet and include the packing detail in the packing slip. Any item for which datasheet are not submitted for approval, vendor to submit packing detail for the same before dispatch. b) All items shall be packed in very good quality packing, the packing shall be such that the items should not be damaged during loading, unloading and transportation. c) The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage areas with heavy rains / high ambient temperature/ coastal area unless otherwise agreed. d) Primary packing of fragile items like lighting panels, fixtures, Junction boxes, CG boxes, switchboards, receptacles etc. shall be done individually with bubble polythene sheet. Secondary packing shall be done in Ply box/Cartoon box with cushioning materials to sustain above mentioned at point “c”. e) Miscellaneous hardware items like clamps, glands, hooks, fasteners, steel chains, couplers, pole accessories(reducer/nipple/U bolt/) etc. shall be packed in sealed gunny bags wrapped in polythene materials. Separate bag must be used for each type of item. f) Packing of conduits, pipes, Metsec channels shall be done with hessian bitumen coated polythene Kraft paper. g) Standard packing shall be adopted for poles & Lamps as per OEM recommendation to avoid any damage. h) Pole accessories may be packed separately in sealed Gunny bags wrapped in polythene materials. However separate bag must be used for each type of pole accessories. i) Mandatory spares items as listed at PART-B, of illumination BOM (Annexure-II) <u>shall be packed and supplied separately with green colour painted box.</u> j) Shelf life items shall be packed separately in black colour painted box for easy identification at site. j) It is vendor's responsibility to see that all the item along with its accessories are supplied. Query if any is received from site regarding discrepancy of illumination package, shall be clarified by the vendor immediately. k) Vendor shall visit to site in to resolve issue related to illumination package, if any as and when informed by BHEL. G. <u>MARKING OF PACKING</u> a) All Packing which will be loaded in a consignment (Cartoon Box/Ply box/Gunny bags/Conduit bundle/ Poles etc.) shall assign a Identification number with PO number as prefix and tag no as suffix (i.e. PO NOXXXXXX /01, 02...etc.). The Identification number shall be marked with indelible paint on top and minimum two sides of such packing. b) Vendor shall allot Identification number serially for packing dispatched from various locations depending upon no. of such packing in consistence with main package. Allotted Identification number shall be marked in each packing of the consignment following the above mentioned method. Vendor to ensure that no packing is dispatched without Identification number. c) Vendor shall securely attach Packing slip in a rain proof transparent enclosure to each packing to be dispatched in a consignment. Packing slip must contain Identification			
	Ref. Doc			

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		number of the packing, LR No. & date as header and PO sl.No., Item description and qty. packed within the packing in a table form. d) Packing containing loose items shall be quantified/numbered/tagged and not merely mentioned as “ONE LOT of loose items”. e) Pallets / crates / cases shall have skid bottoms for handling. Special notations such as ‘Fragile’, ‘This side up’, ‘Weight’, ‘Owner’s particulars’, etc. shall be clearly marked on the package. f) <u>Additionally, each Packet of Mandatory Spare Items shall be clearly marked with “MANDATORY SPARE ITEM” on top and minimum two sides.</u> H. <u>PACKING SLIP</u> a) Detailed packing list shall be prepared by the vendor and submitted to BHEL for review. Item shall be dispatched only after clearance from BHEL. b) Separate packing slip shall be prepared for each consignment dispatched as per attached format (Annexure-IX). Each Packing slip shall have Project Name, consignment No. with date & PO NO. as header. PO sl. no., item description, type of packing (i.e. Carton Box/Ply box/Gunny bags), Identification Nos. of packing, Quantity of item per package, Total quantity of item & No. of packing used for an item shall be listed in a row. Accessories of an item which has been packed in another package, can be listed in subsequent rows of packing slip using above mentioned method. Loose items shall be quantified/numbered/tagged and not merely mentioned as “ONE LOT of loose items”. c) Separate rows of packing slip shall be used for listing each item being dispatched in a consignment. d) Separate packing slip with details mentioned above shall be provided for each Package of Mandatory spares items. <u>IN NO CASE, MAIN PACKAGE ITEMS AND MANDATORY SPARE ITEMS SHALL BE COMBINED IN ONE PACKING LIST.</u> e) Items like poles, GI pipes etc., which are being dispatched in loose as per standard packing, shall be listed in packing slip reflecting total quantity dispatched in a consignment. However accessories for the same which are dispatched in package shall be listed in packing slip using above mentioned method at “b”. f) A separate packing list shall be provided for items having shelf life so as to intimate to site. Such packing list shall have “Shelf life items” as header and mention of shelf life period of each item reflected in it. g) In the consignment receipt, total no. of Carton Box/Ply box/Gunny Bags/ pipe & conduit bundle /poles etc. shall be clearly written and acknowledgement of the same shall be obtained from site and submitted to BHEL for review and records. I. <u>INSPECTION, TESTING & QUALITY ASSURANCE:</u> I. GENERAL. Quality assurance shall follow the requirements of BHEL Quality Assurance documents as applicable. Detail instruction pertaining to inspection, Quality Assurance Plan, inspection / testing procedure is enclosed as Annexure-VII. II. <u>INSPECTION INSTRUCTION (For Inspector & Vendor)</u> a) Following document must be referred during inspection - Illumination Spec. for general requirement of material. - Datasheet of item duly approved as Code-1, stamped and signed by design engineer for specific detail like dimension, paint shade, accessories detail, BOQ and any		
Ref. Doc				

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		comment which are marked on the datasheet. In case any contradiction is observed between Spec. and approved datasheet, only technical specification of approved datasheet shall be referred. iii) Inspection check list as per format at Annexure-VIII. iv. Other quality documents as listed in QAP. b) Inspector shall fill the respective field of inspection check list attached at Annexure-VIII and sign against each inspection check point listed in the Format. The signed copy of format shall be submitted to BHEL for review. c) If any anomaly is observed during inspection w.r.t. Spec./Approved datasheet/Inspection check list regarding quality, quantity or accessories, same shall be immediately brought to the notice of BHEL in writing. Such material shall not be approved without consent of BHEL. d) Inspection of any item will not be termed as completed until satisfactory report from Inspector is submitted to BHEL. e) Items which are to be dispatched in parts, Inspector shall inspect each and every sub item and satisfy himself for suitability of the same during assembly. Vendor shall demonstrate the assembling of such item. f) Some item may require functional test, Inspector is advised to witness the test at manufacturer's work before clearing the material. g) Inspector shall inspect the packing of material w.r.t. method mentioned in approved datasheet and Packing instruction indicated in this specification. h) Inspector is advised to check that correct quantity of material along with its associate accessories is packed with correct packing material. i) Inspector shall also check that marking of packing enclosure is done in line with procedure mentioned at "Marking of Packing" in this specification. J. <u>DOCUMENTATION:</u> Documentation shall be in three steps, during offer submission as response to BHEL Enquiry stage, drawing approval stage and during delivery of items stage (As built). All the documents shall be preferably in A3/A4 size. The documentation aesthetics shall be in line with international standards. Document shall have title block, Name of the item, Document/Drg. Number, revision no, page no. etc, additionally PO. Sl. No, PO No. and Project name shall be included in the "AS built" drawing and drawing submitted during approval. Document/drawing without title block and incomplete information will not be acceptable. Bidder shall be responsible for creating, making and arranging complete documentation as per BHEL requirements at all stages. Vendor shall visit BHEL office within one week of PO/LOI to collect the project specific information for incorporating the same in the drawing/document. a) <u>During Technical offer submission: Two copies of following</u> (i) Filled up Bidder check list as per annexure-VI. (ii) Un-priced price schedule as per clause C- 10 and annexure-III. (iii) Deviation list as per deviation format (Annexure-V). (iv) Catalogue, datasheet of offered items. b) <u>During Drawing approval after PO Placement: Three copies of following</u> (i) Data sheet, GA drawings and single line diagrams of all items in the PO as applicable. (ii) Type test certificates of all items as applicable. (iii) CMRI or equivalent test house certificates as applicable. (iv) Quality plan of individual item including all requirements as per annexure-VII.		
Ref. Doc				

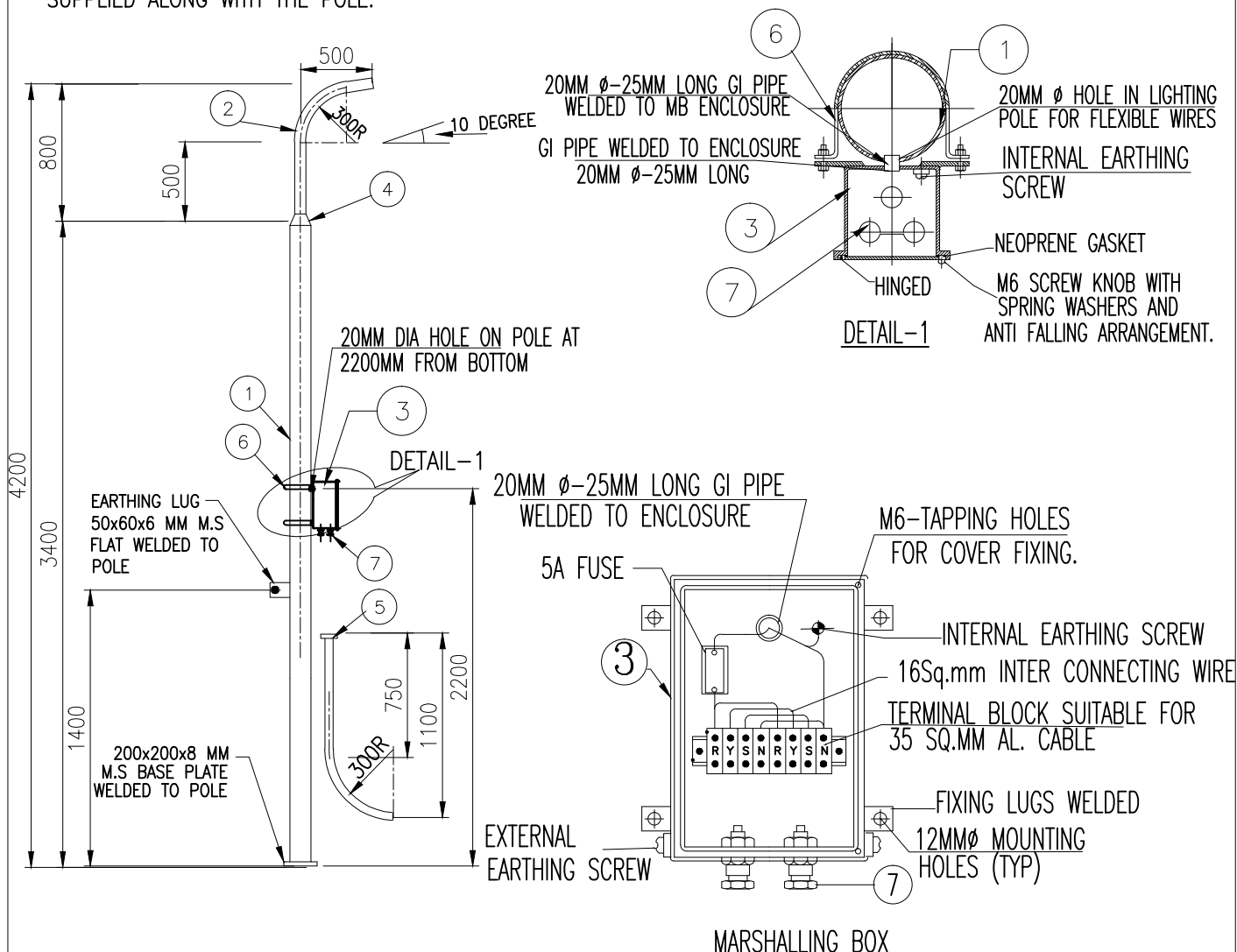
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	(v) Following test reports to be submitted for LED Chip/ LED Luminaires: - LED Parameters like lumen per watt, CRI, Beam angle. - LM 80/IS:16105 report - LM79/IS:16106 report NOTE:-The drawings, data sheets, single line diagrams as applicable shall be furnished within 15 days of LoI/ PO for BHEL's approval. BHEL shall provide comments/ approval within 15 days of receipt of drawings. Vendor shall incorporate comments, if any and submit revised drawings within 7 days. <i>Vendor is responsible for completion of approval cycle and minimizing number of revisions.</i> c) <u>Alongwith material, final documentation:</u> - Packing slip: Along with material 2 copies, BHEL project site – 3 copies, BHEL design office- 3 copies. - Inspection report - BHEL project site – 3 copies, BHEL design office- 3 copies. - Test certificates- BHEL project site – 3 copies, BHEL design office- 3 copies. - Warrantee certificates of equipment if any- BHEL project site – 3 copies, BHEL design office- 3 copies. - Operation & Maintenance manual of equipment, if any- BHEL project site – 3 copies, BHEL design office- 3 copies. - Photocopies of BHEL Approved equipment Datasheet/Drawing - Along with material 2 copies, BHEL project site – 3 copies, BHEL design office- 2 copies. Vendor shall submit all other documents as per commercial terms and condition separately. K. <u>PRICE SCHEDULE:</u> - The items to be supplied as a part of illumination package along with their quantities are listed in the Annexure-II (Illumination BOQ) which is project specific. - Vendor shall quote unit prices and total prices in the format indicated in Annexure-III (Price schedule).The evaluation shall be done on the basis of the overall package price. - The quantities given in Illumination BOM (Annexure-II) may vary to the extent of +/- 10% as per various finalized illumination layouts based on Customer approval. Same shall be informed to bidder at the time of technical scrutiny. For addition/reduction of quantity, unit rate quoted in the present offer shall be considered. - BHEL reserves the right to cancel an item if not required for the project. L. <u>BHEL MATERIAL CODES:</u> <table border="1"> <thead> <tr> <th>Variant No.</th> <th>Description</th> <th>Material Code</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>Illumination Items Package of Solar Power plant (NLC- Neyveli)</td> <td>PY9755229019</td> </tr> <tr> <td>02</td> <td>Mandatory spare for Illumination items package</td> <td>PY9755229027</td> </tr> </tbody> </table>			Variant No.	Description	Material Code	01	Illumination Items Package of Solar Power plant (NLC- Neyveli)	PY9755229019	02	Mandatory spare for Illumination items package	PY9755229027
	Variant No.	Description	Material Code									
01	Illumination Items Package of Solar Power plant (NLC- Neyveli)	PY9755229019										
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RECORD OF REVISIONS											
							Rev. No.	Date	Revision Details	Revised By	Approved By
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Ref. Doc		COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company. ANNEXURE –I (TYPICAL ENGINEERING DRAWING OF MAJOR ILLUMINATION ITEMS)		

TITLE- 4.2M. POLE FOR STREET LIGHT

THIS DRAWING INDICATES TECHNICAL DETAIL OF 4.2 MTR. POLE. IT ALSO COVERS THE BOQ TO BE SUPPLIED ALONG WITH THE POLE.



4.2M POLE FOR STREET LIGHT

SUPPLY OF B.O.Q

SL. NO	DESCRIPTION	UNIT	QTY
1	50NB GI PIPE (CLASS MEDIUM)WITH ONE END THREADED AND OTHER END WELDED BASE PLATE. (LENGTH 3.4 MTR).	No.	01
2	GI BEND PIPE OF OD SUITABLE FOR MOUNTING 30W LED STREET LIGHT(CLASS MEDIUM) WITH 300MM RADIUS BEND, LENGTH AS PER DRAWING.	No.	01
3	MARSHALLING BOX 250X160X90MM MADE OF 1.6MM THICK CRCA SHEET STEEL (IP55 PROTECTION)	No.	01
4	GI REDUCER SUITABLE FOR 50 NB GI PIPE & TOP GI BEND PIPE	No.	01
5	50 DIA GI PIPE MAX. LENGTH. 1.5MTR WITH BEND OF 300 DEGREE RADIUS WITH NIPPLE.	No.	01
6	GI CLAMP WITH ALL HARDWARE FOR FIXING MARSHALLING BOX TO POLE.	No.	02
7	DC BRASS CABLE GLAND FOR MARSHALLING BOX	No.	03

NOTE:—

1. ALL DIMENSIONS ARE IN MM ONLY.
2. MARSHALLING BOX SHALL BE MADE OF 1.6MM CRCA SHEET STEEL AND HOT DIP GALVANISED. JB SHALL HAVE NEOPRENE GASKET WITH IP55 PROTECTION.
3. MB SHALL HAVE 3 NOS. CABLE ENTRY AT BOTTOM, 5A FUSE, WELDED PIPE AND TERMINAL BLOCK AS PER DETAILS.
4. THE POLE SHALL BE HOT DIP GALVANIZED WITH AVERAGE COATING OF 70 MICRON. THREADED PORTION SHALL HAVE ANTI CORROSIVE COATING.
5. TOP BEND PTPE SHALL HAVE OD SUITABLE FOR 30W LED STREET LIGHTING FIXTURE SUPPLIED FOR THE PROJECT.



HYDERABAD

PRODUCT STANDARD

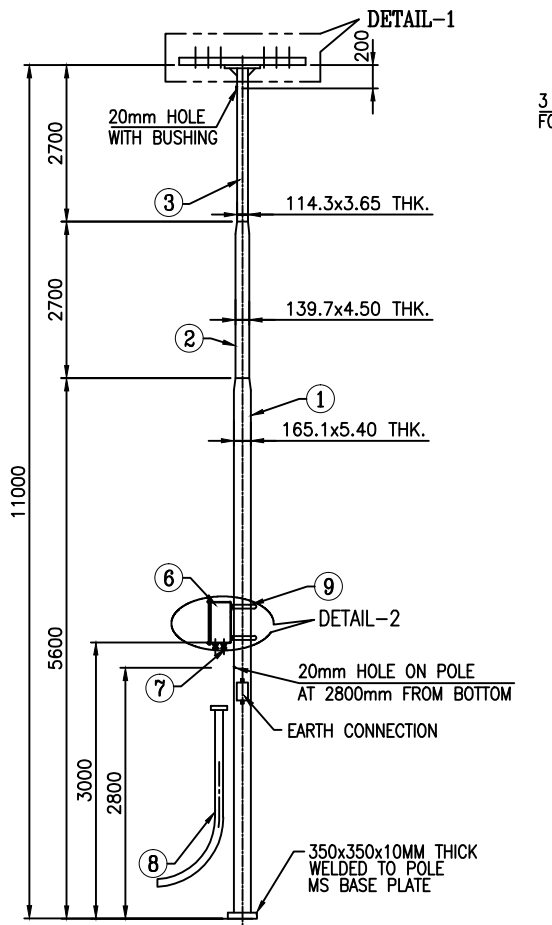
PROJECT ENGINEERING & SYSTEM DIVISION
HYDERABADANNEXURE-1 TO
PY55229

Rev. No. 00

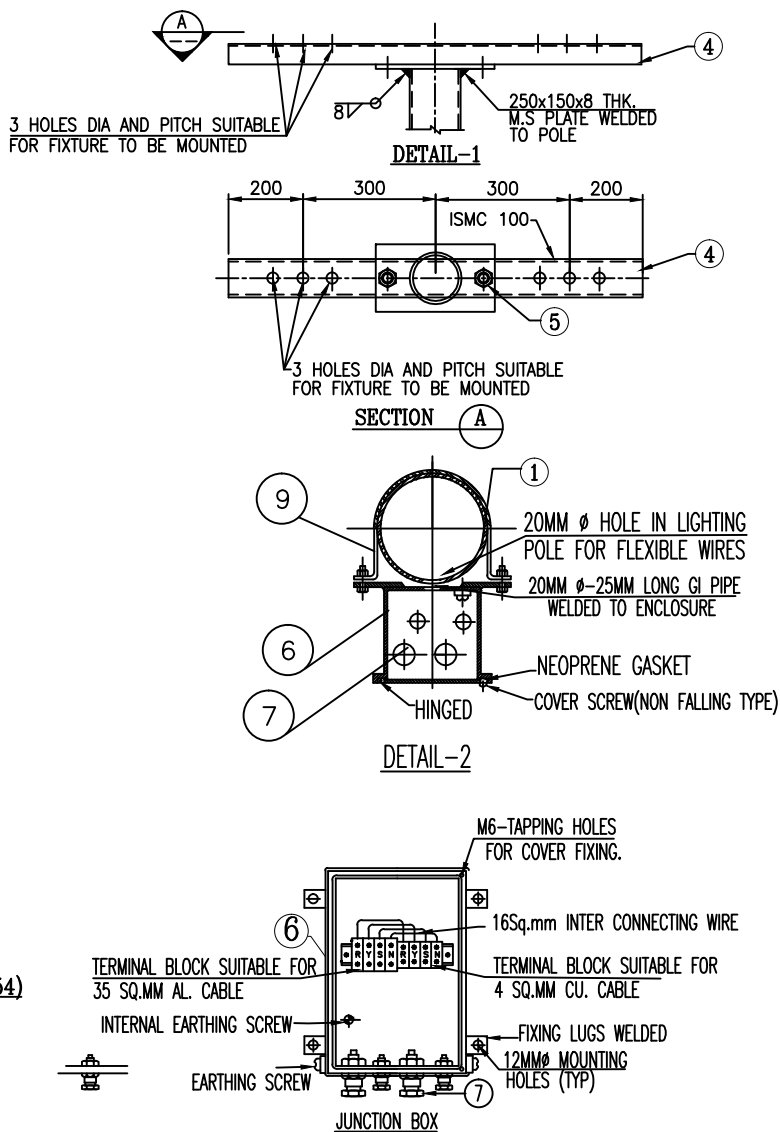
TITLE: 11M. FLOOD LIGHTING POLE

Page 04 OF 06

THIS DRAWING INDICATES TECHNICAL DETAILS OF POLE. IT ALSO COVERS THE BOQ TO BE SUPPLIED ALONG WITH THE POLE



12M FLOOD LIGHTING POLE (TYPE 410 SP-54)



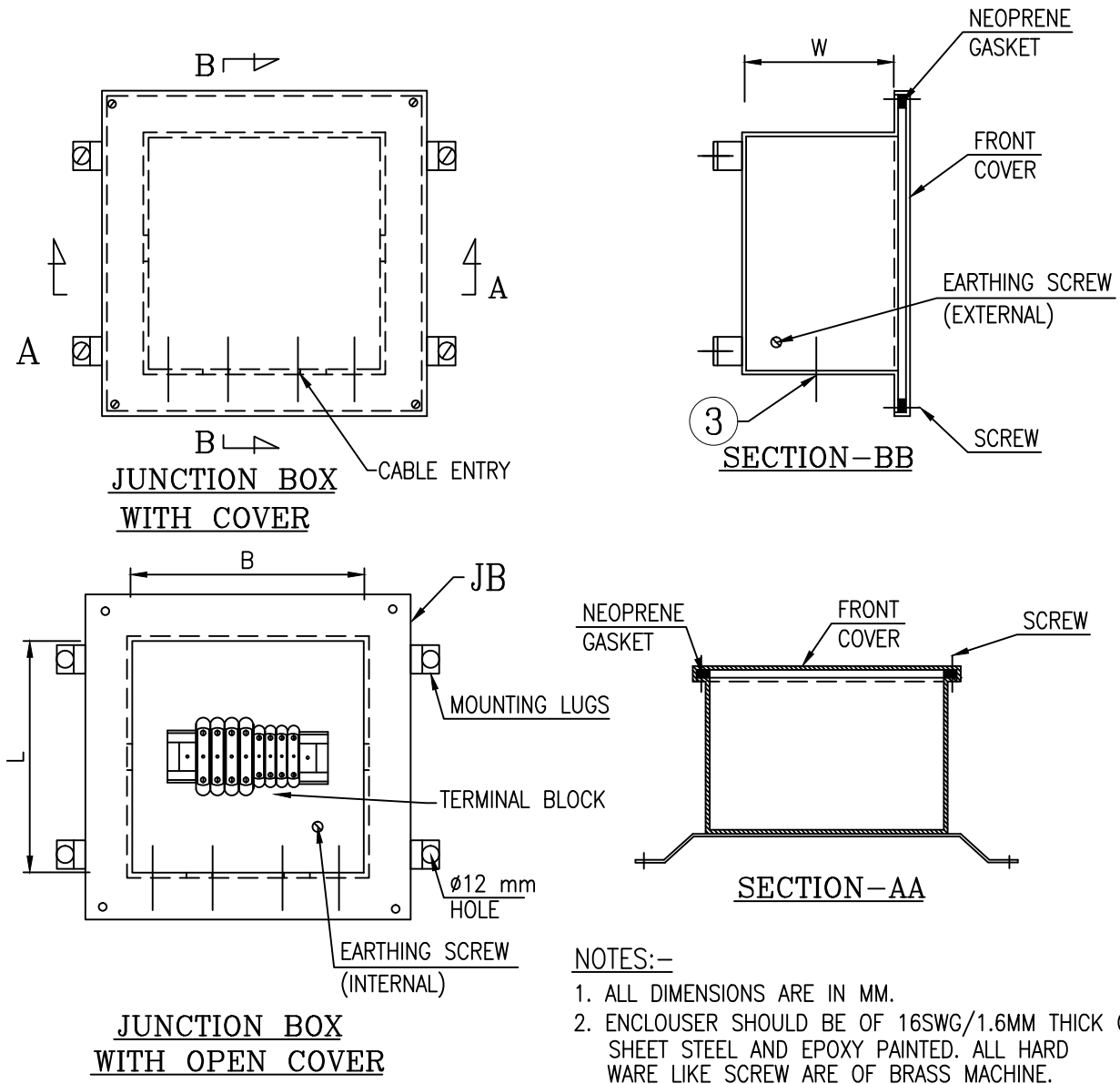
SUPPLY OF B.O.Q

SL. NO.	ITEM DESCRIPTION	UNIT	QTY.	REMARKS
01	FLOOD LIGHTING POLE WITH OD 165.1x5.40mm THK. & 5.6M LONG, TUBULAR ONE SIDE AND OTHER SIDE WELDED BASE PLATE, EARTHING BOLT AND DRILLED HOLES AS PER DETAIL	NO.	01	SHALL BE SUPPLIED IN ASSEMBLED CONDITION
02	FLOOD LIGHTING POLE WITH OD 139.7x4.50mm THK. & 2.7M LONG TUBULAR END AS PER DETAIL	NO.	01	
03	FLOOD LIGHTING POLE WITH OD 114.3x3.65mm THK. & 2.7M LONG, DRILLED HOLE AND WELDED MS PLATE 250X150X8MM AS PER DETAIL	NO.	01	
04	ISMC 100 LENGTH 1M WITH DRILLED HOLE AS PER DETAIL	NO.	01	
05	BOLT & NUT TO FIX ISMC 100 WITH MS PLATE	NO.	02	SHALL BE SUPPLIED IN LOOSE
06	4WAY WEATHER PROOF JUNCTION BOX (250X160X90MM) OF CRCA 1.6MM THICK (IP55).	NO.	01	
07	DC BRASS CABLE GLAND FOR MARSHALLING BOX	NO.	03	
08	G.I PIPES FOR INCOMING AND OUTGOING CABLES Ø50mm&1.5MTR. LENGTH WITH BEND AT 1 MTR LENGTH	NO.	01	
09	GI CLAMP WITH ALL HARDWARE FOR FIXING MARSHALLING BOX TO POLE	NO.	02	
10				
11				
12				

NOTE:-

- ALL DIMENSIONS ARE IN MM ONLY.
- MARSHALLING BOX SHALL BE MADE OF 1.6MM CRCA SHEET STEEL, HOT DIP GALVANISED. JB SHALL HAVE NEOPRENE GASKET WITH IP55 PROTECTION.
- MB SHALL HAVE 3 NOS. CABLE ENTRY AT BOTTOM, 5A FUSE, WELDED PIPE AND TERMINAL BLOCK AS PER DETAILS.
- LIGHTING POLE SHALL BE CONFORM TO IS 2713-1980.
- THE POLE SHALL BE COATED WITH BITUMINOUS COMPOUND PAINT INTERNALLY AND EXTERNALLY EXTERNALLY UPTO 1800MM FROM BOTTOM. EXPOSED SURFACE SHALL BE COATED WITH ONE COAT OF RED OXIDE PRIMER & FINISHED WITH TWO COATS OF ALUMINUM PAINT.

THIS DRAWING INDICATES TECHNICAL DETAILS OF JUNCTION BOX.IT ALSO COVERS THE BOQ TO BE SUPPLIED ALONG WITH THE JB.

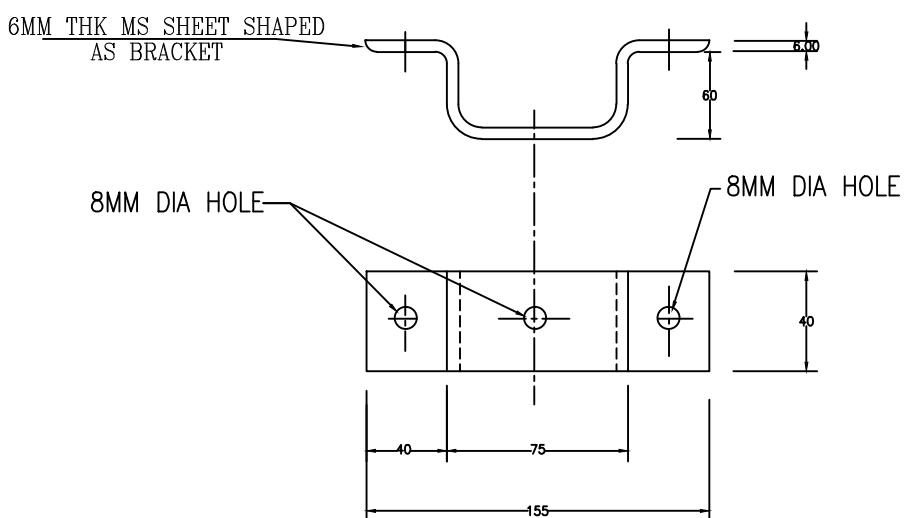


- NOTES:-
1. ALL DIMENSIONS ARE IN MM.
 2. ENCLOUSER SHOULD BE OF 16SWG/1.6MM THICK CRCA SHEET STEEL AND EPOXY PAINTED. ALL HARD WARE LIKE SCREW ARE OF BRASS MACHINE.
 3. DIMENSION OF JB SHALL BE AS PER PROJECT REQUIREMENT AND SHALL BE MEASURED FOR INTERNAL DIMENSION OF JB OPENING ONLY.
 4. JB SHALL HAVE IP55 (MIN.) PROTECTION.

SUPPLY BOQ

SL. NO.	ITEM DESCRIPTION	UNIT	QTY.
01	4 WAY WEATHER PROOF JUNCTION BOX WITH IP55 PROTECTION.	NO.	01
02	DOUBLE COMPRESSION CABLE GLAND SUITABLE FOR CABLE ENTRIES.	NO.	04
03	BLANKING PLUG	NO.	01
04	CU. LUGS	NO.	AS REQD.
05	M10X40MM NUTS & BOLTS WITH WASHER.	NO.	04
06			
07			

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TD-201 Rev. No. 00 Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING HYDERABAD	ANNEXURE-1 TO PY55229 Rev. No. 00
COPYRIGHT AND CONFIDENTIAL The Information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.	TITLE: GI CLAMP & 25MM CONDUIT BEND PIPE		Page 06 OF 06
	 GI CLAMP FOR BATTEN TYPE FIXTURE 25MM NB GI PIPE WITH BEND (1.5M LENGTH)		
Ref. Doc.	NOTES:- 1. ALL DIMENSIONS ARE IN MM.		

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Ref. Doc		COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company. ANNEXURE –II (ILLUMINATION BOM)		

Project:- NLC-Neyveli		ILLUMINATION BOQ Annexure-II to PY55229	REV00 Date:- 26.08.2016
SITE LOCATION: Neyveli-TN			
PART-A :- LIST OF ITEMS FOR MAIN ILLUMINATION PACKAGE (MATERIAL CODE - PY9755229019)			
SL NO.	DESCRIPTION (FIXTURES / LAMPS / ACCESSORIES)	UNIT	QTY.
1	40W LED surface mounted baton type fixture. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCIDP 40W LED or equivalent with minimum lumen output of the system 3957 lumen)	Nos	16
2	30W LED Street Lighting Fixture of pressurised Die Cast LM6 alloy housing with inbuilt heat sink and vandal proof proof prismatic poly carbonate cover. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCLST 30W LED or equivalent with minimum lumen output of system 2300 lumen)	Nos	963
3	120W LED Flood Lighting Fixture of pressurised Die Cast LM6 alloy housing with separate driver compartment, heat sink etc. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BARFEG 120W LED or equivalent with minimum lumen output of system 10800 lumen)	Nos	18
4	2.2M Street Lighting Pole with Marshalling Box, GI bend pipe and other accessories as per details indicated at Annexure-1. Top bend pipe of Pole shall be suitable for mounting LED street lighting fixture at Sl.no.2.	Nos	307
5	4.2M Street Lighting Pole with Marshalling Box, GI bend pipe and other accessories as per details indicated at Annexure-1. Top bend pipe of Pole shall be suitable for mounting LED street lighting fixture at Sl.no.2.	Nos	654
6	11M Flood Lighting Pole with Marshalling Box, GI bend pipe and other accessories as per details indicated at Annexure-1.	Nos	4
7	250x200x100mm rectangular Junction Box of 1.6mm CRCA sheet steel with Epoxy painted. JB shall have IP55 protection with neoprene gasket and 4nos. cable entry at bottom. JB shall be supplied with 4nos. Brass cable gland (2nos. Suitable for 4Cx25sqmm Al. cable & 2nos. suitable for 3Cx2.5sqmm cu. cable) and necessary terminal block of 4nos. for 35sqmm wire & 4nos. for 4 sqmm wire.	Nos	16
8	20A, 1ph industrial metal clad type socket (Outdoor type, IP55 protection) with Plug and MCB. Socket unit shall have 2nos. cable entry at bottom Suitable for 3Cx6sqmm Al. cable for loop In/Out and 4nos. TB suitable for 6sqmm wire. Receptacle shall be supplied with 2nos. suitable Brass cable gland.	Nos	2
9	63A, TPN welding socket (Outdoor type, IP55 protection) with Plug and necessary interlocked switch. Receptacle shall have 2nos. cable entry at bottom Suitable for 4Cx35sqmm Al. cable for loop In/Out and 4nos. TB suitable for 35sqmm wire. Receptacle shall be supplied with 2nos. suitable Brass cable gland.	Nos	2
10	SSB-4 Surface mounted switchboard with 2nos. 5A piano type switch & 2nos. 5/15A socket with switch (Modular type)	Nos	9
11	25mm NB GI bend pipe as per details at Annexure-1	Nos	10
12	GI Clamp for mounting Batten type fixture as per details at Annexure-1	Nos	32
13	Cable clamp suitable for 4Cx25 sqmm Al. cable	Nos	250
14	Cable clamp suitable for 3Cx2.5 sqmm Cu. Cable	Nos	250
PART - B:- MANDATORY SPARE - ILLUMINATION ITEMS PACKAGE (MATERIAL CODE - PY9755229027)			
SL NO.	DESCRIPTION OF ITEM	UNIT	QTY.
1	40W LED surface mounted baton type fixture. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCIDP 40W LED or equivalent with minimum lumen output of the system 3957 lumen)	Nos	2
2	30W LED Street Lighting Fixture of pressurised Die Cast LM6 alloy housing with inbuilt heat sink and vandal proof proof prismatic poly carbonate cover. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCLST 30W LED or equivalent with minimum lumen output of system 2400 lumen)	Nos	97
3	120W LED Flood Lighting Fixture of pressurised Die Cast LM6 alloy housing with separate driver compartment, heat sink etc. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BARFEG 120W LED or equivalent with minimum lumen output of system 10800 lumen)	Nos	2
NOTE:			
1.) For bid evaluation, items against Part A & Part-B above shall be considered on overall package basis.			
2.) 1. The quantities given in Illumination BOM (Annexure-II) may vary to the extent of +/-10% as per various finalized illumination layouts based on Customer approval. Same shall be informed to bidder at the time of technical scrutiny. For addition/reduction of quantity, unit rate quoted in the present offer shall be considered.			

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Project:- NLC-Neyveli		PRICE SCHEDULE		REV00		
		Annexure-III to PY55229		Date:- 26.08.2016		
Enq. NO.:-						
Name of the Bidder:-						
Offer Ref. No.:-						
I. NOTE:-						
1. This format details the price schedule for the enquiry. Bidder shall fill up this format only. No other format will be entertained. No cognizance will be taken of any change made by bidder with respect to this format issued by BHEL and contents of this format shall prevail.						
2. Bidder to filled in writing "Quoted" against each item of the package mentined in the format and submit along with technical offer as a token of his concurrence that all items were quoted along with unit prices. If not submitted in this format or any field is left blank, the offer will be liable for rejection. For discrepancies, if any, in the bid with respect to Quantity, Rates & Totals, etc., BHEL discretion shall be applicable.						
3. Vendor shall fill up prices of various items and submit to BHEL in separate sealed cover as part of commercial offer. The commercial bid shall be submitted as per commercial terms and conditions.						
4. For bid evaluation, Grand Total Price of items against Part A & Part B below shall be considered on overall package basis.						
II. SUPPLY						
SL NO.	DESCRIPTION OF ITEM	UNIT	QTY.	UNIT PRICE (RS.)	TOTAL PRICE (RS.)	QUOTED (YES/NO)
1	A. MAIN ILLUMINATION PACKAGE (MATERIAL CODE - PY9755229019)	Set	1	NA		
2	B. MANDATORY SPARE - ILLUMINATION ITEMS PACKAGE (MATERIAL CODE - PY9755229027)	Set	1	NA		
III. UNIT PRICES OF MAIN ILLUMINATION PACKAGE & MANDATORY SPARES						
PART-A :- MAIN ILLUMINATION PACKAGE (MATERIAL CODE - PY9755229019)						
SL NO.	DESCRIPTION (FIXTURES / LAMPS / ACCESSORIES)	UNIT	QTY.	UNIT PRICE (RS.)	TOTAL PRICE (RS.)	QUOTED (YES/NO)
1	40W LED surface mounted baton type fixture. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCIDP 40W LED or equivalent with minimum lumen output of the system 3957 lumen)	Nos	16			
2	30W LED Street Lighting Fixture of pressurised Die Cast LM6 alloy housing with inbuilt heat sink and vandal proof prismatic poly carbonate cover. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCLST 30W LED or equivalent with minumum lumen output of system 2300 lumen)	Nos	963			
3	120W LED Flood Lighting Fixture of pressurised Die Cast LM6 alloy housing with separate driver compartment, heat sink etc. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BARFEG 120W LED or equivalent with minumum lumen output of system 10800 lumen)	Nos	18			
4	2.2M Street Lighting Pole with Marshalling Box, GI bend pipe and other accessories as per details indicated at Annexure-1. Top bend pipe of Pole shall be suitable for mounting LED street lighting fixture at Sl.no.2.	Nos	307			
5	4.2M Street Lighting Pole with Marshalling Box, GI bend pipe and other accessories as per details indicated at Annexure-1. Top bend pipe of Pole shall be suitable for mounting LED street lighting fixture at Sl.no.2.	Nos	654			
6	11M Flood Lighting Pole with Marshalling Box, GI bend pipe and other accessories as per details indicated at Annexure-1.	Nos	4			
7	250x200x100mm rectangular Junction Box of 1.6mm CRCA sheet steel with Epoxy painted. JB shall have IP55 protection with neoprene gasket and 4nos. cable entry at bottom. JB shall be supplied with 4nos. Brass cable gland (2nos. Suitable for 4Cx25sqmm Al. cable & 2nos. suitable for 3CX2.5sqmm cu. cable) and necessary terminal block of 4nos. for 35sqmm wire & 4nos. for 4 sqmm wire.	Nos	16			
8	20A, 1ph industrial metal clad type socket (Outdoor type, IP55 protection) with Plug and MCB. Socket unit shall have 2nos. cable entry at bottom Suitable for 3Cx6sqmm Al. cable for loop In/Out and 4nos. TB suitable for 6sqmm wire. Receptacle shall be supplied with 2nos. suitable Brass cable gland.	Nos	2			
9	63A, TPN welding socket (Outdoor type, IP55 protection) with Plug and necessary interlocked switch. Receptacle shall have 2nos. cable entry at bottom Suitable for 4Cx35sqmm Al. cable for loop In/Out and 4nos. TB suitable for 35sqmm wire. Receptacle shall be supplied with 2nos. suitable Brass cable gland.	Nos	2			
10	SSB-4 Surface mounted swirchboard with 2nos. 5A piano type switch & 2nos. 5/15A socket with switch (Modular type)	Nos	9			
11	25mm NB GI bend pipe as per details at Annexure-1	Nos	10			

12	GI Clamp for mounting Batten type fixture as per details at Annexure-1	Nos	32			
13	Cable clamp suitable for 4Cx25 sqmm Al. cable	Nos	250			
14	Cable clamp suitable for 3Cx2.5 sqmm Cu. Cable	Nos	250			
PART-B:- MANDATORY SPARE - ILLUMINATION ITEMS PACKAGE (MATERIAL CODE - PY9755229027)						
SL NO.	DESCRIPTION OF ITEM	UNIT	QTY.	UNIT PRICE (RS.)	TOTAL PRICE (RS.)	QUOTED (YES/NO)
1	40W LED surface mounted baton type fixture. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCIDP 40W LED or equivalent with minimum lumen output of the system 3957 lumen)	Nos	2			
2	30W LED Street Lighting Fixture of pressurised Die Cast LM6 alloy housing with inbuilt heat sink and vandal proof proof prismatic poly carbonate cover. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BCLST 30W LED or equivalent with minimum lumen output of system 2400 lumen)	Nos	97			
3	120W LED Flood Lighting Fixture of pressurised Die Cast LM6 alloy housing with separate driver compartment, heat sink etc. LED Chip of fixtures shall be LM80 certified. (Bajaj catalogue BARFEG 120W LED or equivalent with minimum lumen output of system 10800 lumen)	Nos	2			
			Signature along with Company Seal			

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		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD -32		Annexure-IV to PY55229	
				Rev 00	
				Page 02 Of 02	
SUB VENDOR LIST FOR ILLUMINATION PACKAGE					
PROJECT : 65MW SOLAR POWER PLANT AT NEYVELI - TN					
S.NO		ITEM DESCRIPTION		VENDOR	
1	LED Lighting Fixture	M/S Wipro (Approved by Customer)			
		M/S Havell's (Approved by Customer)			
		M/S Crompton (Approved by Customer)			
		M/S Bajaj (Approved by Customer)			
		M/S Philips (Approved by Customer)			
		AVANI **(Yet to be approved by Customer)			
		GAUTAM SOLAR **(Yet to be approved by Customer)			
		IMPULSE SYSTEM **(Yet to be approved by Customer)			
		K Lite **(Yet to be approved by Customer)			
		NESA ILLUMINATION TECHNOLOGY **(Yet to be approved by Customer)			
		OLIVE **(Yet to be approved by Customer)			
		Osram **(Yet to be approved by Customer)			
		PHOTONICS **(Yet to be approved by Customer)			
		Promptec **(Yet to be approved by Customer)			
		Surya Roshni **(Yet to be approved by Customer)			
2	Cable Glands	United Agro Engineering Pvt Ltd, Flexpro Electricals Pvt. Ltd., FCG Power Industries, Prompt Engineering Works, Flameproof Equipments Pvt. Ltd., FCG Flameproof Control Gears, Electromac Industries			
3	Cable Lug	Automatic electric, Chetna engineering, Electromac, Forward engineering industries.			

Notes:

- ** As of now these makes are not approved by End customer. These makes shall be approved by end customer subjected to below condition:
Bidder to submit documentary evidence to show that similar or higher capacity component/equipment/system has been supplied by the Bidder or their associate/collaborator. The documentary evidence shall be in the form of PO Copy, Material receipt certificate/ Site Inspection report/ Installation or erection report etc. from the end user, site/ purchase premises for having received the material. Any delay on account of approval from Customer shall be Bidder's responsibility and shall not be attributed to BHEL.

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BHARAT HEAVY ELECTRICALS LIMITED
HYDERABAD -32

Annexure-V to PY55229

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DEVIATION FORMAT

(TO BE FILLED BY BIDDER AND FURNISH ALONGWITH OFFER)

Project Name:-

Enquiry No.:-

Name of Bidder:-

Offer Reference No.:-

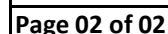
Sl.No	Item	Clause No. & Spec. No	Description as per specification	Deviation taken	Nature of Deviation	REMARKS

NOTES

1. Technical offer of the bidder will be evaluated only on the basis of Deviation Schedule
2. Deviation Schedule constitutes this Sheet(with these Notes) duly signed & stamped.
3. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored.
4. Additional sheets in the same format can be enclosed by the vendor, if necessary.
5. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market.
6. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of Price implications.
7. Reasons for the deviations shall be specified in the Remarks column.
8. If there are no deviations from the specifications, bidder still has to submit the Deviation Schedule by writing “NO Deviations” in this format.
9. If the “Deviation Schedule” is not submitted along with the offer, the bidder’s offer is likely to be rejected without any further interaction with the bidder.

SIGNATURE OF BIDDER WITH SEAL & STAMP

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SL. NO.	DESCRIPTION	BIDDER CONFIRMATION	REMARKS
1	Offer for all items with quantity listed at Annexure-II (Illumination BOM) along with all accessories mentioned in illumination technical specification including mounting accessories.		
2	All offered items and its associative components are strictly make from manufacturer listed in sub vendor list (Annexure-IV) or mentioned elsewhere in the Illumination specification.		
3	All offered items are manufactured in conformity with national & international standard and adopted best engineering practices within the scope of supply.		
4	Clause wise deviation in the prescribed format (Annexure-V)submitted along with offer for any deviation to Illumination specification. If no deviation then also deviation format submitted indicating "NIL Deviation".		
5	Availability of all necessary test data and certification copy to prove technical compatibility of all offered items and confirm to provide the same as and when asked by BHEL. All test data and certification shall have validity till the end of the execution of project. Also confirm to undertake responsibility to replace all items, if fails to prove their technical compatibility as per illumination specification.		
6	Filled in unpriced price schedule as per clause C.10 in the prescribed format(Annexure-III) submitted along with offer.		
7	Total compliance to illumination Specification for all offered items.		
		SIGNATURE OF BIDDER WITH SEAL & STAMP	

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		<u>QUALITY SYSTEM, INSPECTION & TESTING OF EQUIPMENT AT MANUFACTURER'S PREMISES</u> 1. GENERAL:- - Inspection & testing of equipment shall be carried out by BHEL / CUSTOMER / BHEL appointed third party at the works of Vendor/Sub vendor during manufacturing and/or on final product to ensure conformity of the same with acceptable criteria of technical specifications, approve drawings, manufacturing drawing and acceptable national / international standards. - Inspection & test carried out by BHEL or BHEL appointed third party shall not absolve the responsibility of the vendor to provide acceptable product as per terms of contract nor shall it preclude subsequent rejection. - BHEL reserve the right to inspect any product at any stage of manufacturing beyond pre – identified stages & hold points of approve QAP. 2. QUALITY SYSTEM REQUIREMENTS - The vendor must recognize the importance of quality and follow defined quality program in all stages of manufacturing and quality control activities of the product. Vendor must define and implement the tasks and control that will provide needed assurance for the procured components / items. All the brought out equipment or component shall be procured from vendors which are listed in the sub- vendor list. - BHEL reserve the right to verify the quality programme of vendor & its sub vendors to ensure effectiveness of program to meet the intended and specified quality of the product. 3. QUALITY ASSURANCE PLAN - The vendor shall furnish Quality assurance plan (QAP) for respective equipment after completion of detail engineering for BHEL approval. - QAP shall be prepared & furnish by vendor as per guide lines mentioned at Annexure-XI. - The vendor shall indicate procurement source and furnish following document to BHEL, during the submission of QAP for scrutiny & final approval by BHEL. - Copies of PO - Technical specification - BHEL approved GA drawings/ datasheets - Detail manufacturer drawing - Back up reference materials - The submission & subsequent approval of QAPs shall be ensured to be restricted to one round only. - Inspection and test requirements shall be decided with due consideration of factors like safety, duty cycle, operating conditions, equipment life, environmental condition, place of installation and statutory regulation as applicable, for a particular equipment. Any additional type or special tests or routine tests if found necessary to establish the intended quality after detailed engineering then same shall have to be incorporated in the QAPs without any commercial implication.		
Ref. Doc				

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		f) The vendor shall submit documents to demonstrate that the vendor and his sub-vendors follow, QA/QC program meeting the requirements set forth in this section. Typical inspection requirements for some of the critical equipment are appended in this section of the specifications. These indicated requirements are minimum and from the BHEL's perspective. Vendor can review the same and supplement based on their experience and practice for all items. g) Detailed QAP shall be prepared by Vendor in consultation with their sub vendor/manufacturers to avoid any complicity later. 4. CALIBRATION OF MEASURING EQUIPMENT a) All the measuring equipment used for inspection & testing shall be calibrate and appropriate accuracy class of measuring equipment shall be used. Calibration standards used for calibration of measuring instrument shall be traceable to national standards of National Physical Laboratory (NP) with unbroken chains of comparison. b) Valid calibration certificates for all measuring instrument used during inspection and testing at manufacturer's works, with traceability to National standards of NPL/NABL accredited laboratories shall be furnished prior to undertaking inspection by BHEL. c) Calibration certificate shall also indicate reference no. of calibration standards calibrated by NPL/NABL accredited laboratories and copies of such calibration certificates of calibration standards shall be included in the complied dossiers of inspection/test result. 5. TEST CERTIFICATE AND DOCUMENT a) For each items being manufactured as per approved QAP, following test certificates and documents as applicable for each equipment/item, inthe requisite copies including original, duly endorsed by the manufacturer/vendor with appropriate linkage to project, purchase order and acceptance criteria etc. shall be submitted to BHEL. - Raw material identification & physical and chemical test certificates for all material used in manufacture of the equipment/item. - WPS, PQR & WPQ documents as per applicable code. - Details of stage wise inspection & rectification records of fabricated items, casting, forging and machined items. - Control dimension chart with records of alignment, squareness etc. - Manufacturer's material and performance/ relevant test certificate for all brought out items. - Details of heat treatment and stress relieving charts as per specification. - Non destructive test reports as per respective code. - Hardness test certificates. - Pressure/leakage test certificates. - Weather proof test certificates as per applicable codes. - Performance test certificates for all characteristics. - Routine/ type /calibration/acceptance/special test(Type test etc.) certificates. - Surface preparation and painting certificates. - Certificates from competent authority for the items coming under statutory regulations.(i.e. CIMFR, PESO, DGMS etc. - BIS license certificate. b) Where physical and chemical test certificates of material are not available, the vendor shall arrange to have specimens and test samples of the materials, tested in his own		
Ref. Doc				

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		laboratory at his cost and submit copies of test results in requisite numbers to BHEL for review. Number of test samples against each batch of materials as applicable shall be as per relevant Indian or International standards. c) Where facilities for testing do not exist in the vendor or sub vendor's laboratories or in case of any dispute, samples and test pieces shall be drawn by the vendor in presence of BHEL or BHEL nominated third party and sealed sample shall be sent to any Govt. approve / NABL accredited laboratory for necessary tests at vendor's own cost. d) The BHEL shall have right to be present and witness all tests being carried out by the vendor/sub vendor/manufacturer at their own laboratory or approved laboratories. Also, the inspection team of BHEL shall reserve the right to call for confirmatory test on samples, at his discretion. e) Only latest edition of codes / standards and specification shall be used for materials and testing. The latest revision means the revision whose date of revision is closest to the contract date. 6. INTERNAL INSPECTION BY VENDOR/MANUFACTURER a) Inspection and tests shall be carried out by Vendor/manufacturer in accordance with BHEL approve drawings, Technical specification, PO and approve QAP. They shall maintain records of each inspection and test carried out and signed documents shall be submitted to BHEL for verification. b) The vendor shall carry out internal inspection & obtain clearance from statutory bodies e.g. IBR, CCE, TAC, weight & measures, safety, IE rules etc. prior to offering any equipment for BHEL inspection in accordance with approve QAP. c) The vendor shall identify all inspected equipment/items/raw material and shall maintain the record of status of inspection viz. inspected & found acceptable, require rectification/rework, rejected etc. d) The vendor shall establish and maintain procedures to ensure that the product that does not conform to specified requirements is prevented from inadvertent dispatch. The description of non-conformity that has been accepted subsequently by BHEL by concession and/or repair shall be recorded. e) Repaired and reworked product shall be offered for re-inspection to BHEL along with records of corrective action taken. 7. METHOD OF UNDERTAKING INSPECTION & TESTING BY BHEL a) Inspection call shall be given only on readiness of the equipment/assembly and after approval of all relevant drawings and QAP. b) All documents like test certificates, internal inspection reports, PO, Technical specification, approve QAP, approve GA drawing/ datasheets, Manufacturing drawings, Inspection check list shall be arranged and handed over to inspector before inspection. <u>Inspection without above document shall be treated as incomplete.</u> c) The hard copy of such documents must also accompany a CD (comprising computer readable files) containing the identical documents. d) On receipt of inspection call pertaining to package equipment, QA & inspection group of BHEL shall organize inspection visit or will issue inspection assignment to BHEL approved third party (Based on the nearness to the manufacturer's works). For further inspecting pertaining to the same equipment, vendor may forward the subsequent inspection call to the concern inspection agency with a copy to QA & Inspection section of BHEL Hyderabad.		
Ref. Doc				

TD-201 Rev No. 00	Form No.		PRODUCT STANDARD PROJECT ENGINEERING HYDERABAD	Annexure-VII to PY55229 Rev No. 00 Page 5 of 10
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		8. OBLIGATION OF VENDOR a) The vendor shall provide all facilities and ensure full and free access of the inspection Engineer of BHEL to their own or sub vendor's premises to facilitate him carry out inspection and testing of the product during manufacturing of the same. b) The vendor shall provide all instruments, tools, necessary testing & other inspection facilities to BHEL inspector free of cost for carrying out inspection. c) The vendor shall comply with instructions of BHEL fully and with promptitude. d) The cost of testing welds, radiographic and dye penetration tests etc. if applicable, in the fabrication workshop shall be borne by the vendor. e) The vendor shall ensure that the equipment/assembly/component require to be inspected, are not dispatched before inspection. f) Vendor shall submit Engineering design datasheet with necessary technical details and manufacturer design sketches of all offered items for review by BHEL and obtain approval for the same. It will be vendor's responsibility to revise the design as per the BHEL's observation made on the design datasheet in line with specification requirement till final approval is obtained. Vendor shall not proceed with manufacturing of item unless submitted design is approved by BHEL in all respect. g) Vendor may categorize some items for stage inspection with manufacturing of few sample item, if agreed by BHEL for clearance of mass production. After the mass production, vendor shall call BHEL for re- inspecting the lot. It will be vendor's responsibility to manufacture the item in line with inspected sample, BHEL will not be held responsible by anyway if the item is rejected due to deviation from sample item. h) For equipment not covered by any other approved standards, the tests to be carried out shall be in accordance with the Vendor's quality assurance program which to be agreed between the Vendor and the BHEL. Vendor shall furnish a comprehensive list of the tests for such items and include the same in the quality plan during offer. i) If vendor fails to furnish list of test to be carried out at vendor's works for items not covered by any approved standards, BHEL at his discretion may called for any test to be performed at vendor's works. j) Vendor is responsible for providing inspection check list as per attached format at annexure-VIII for each item to be inspected and get it endorsed by the inspector. Vendor shall submit signed copy of inspection check list along with other QAP documents as listed elsewhere to BHEL for their perusal. k) Dispatch clearance of any item will not be issued if vendor fails to provide satisfactory inspection checklist & test certificates and other quality related documents.		
Ref. Doc				

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				Rev 00	
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MINIMUM INSPECTION REQUIREMENT					
FIXTURE					Action by BHEL
1. DOCUMENT			Purchase order, Technical specification of BHEL, BHEL approved drawings/documents/Datasheet,QAP, Consumables certificates and any special requirements		R
2. Materials	Enclosure, reflector, PVC Cables/wires, wire guard, gasket, bracket and brought out items		Material test certificates, Inspection authority stamp correlation with material & TPI stamp verification, manufacturer guarantee certificate and routine test report		R
			If any specific / additional test requirements		R
3. In process inspection	Fabrication of enclosure, reflector, wire guard, bracket		Dimension, Drilling and weld quality		R
	Assembly of fixture		Dimension, cable opening, mounting arrangement		R
	Painting of fixture and finishing		Surface treatment, paint quality, finish colour, shade and thickness		R
	Wiring		Arrangement of terminal blocks, wiring continuity, clamping, Tag provision		R
5. Final inspection	Physical check		Fixture, internal & external reflector, Gasket, wire guard, Glass/acrylic cover, mounting arrangement , cable entries, IP class, Lamp holder type and voltage rating vs approved datasheet.		W
			Name plate for correct entries of Model No. Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc.		W
			Cable entry and terminal block size and type of cable gland used		W
			Make of fixture and accessories		W
			Paint quality, finish colour, shade and thickness		W
	Assembly check		lamp, reflector, cable gland, wire guard for proper fitment to the fixture.		W
	Functional check		Lamp with ballast & Control gear. For Non Integral type Fixture CG box shall be kept 30M away from lamp compartment.		W
			DC fixture with Converter		W
	Document check		Material test certificate for all type of materials used, Painting quality test certificate, IP class test certificate, Routine test certificate, BIS License copy if applicable, Test certificates from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS for flame proof item, Guarantee/Warranty certificate.		R
	6. Packing & dispatch	Packing		Soundness of packing, preservation & documentation as per specification.	
			Marking of packing for easy identification		V
Dispatch			Format of Packing slip & quantity as per scope of supply		V
Abbreviations used : R- Review, W- Witness, V- Verify					



MINIMUM INSPECTION REQUIREMENT

JUNCTION BOXES			Action By BHEL
1. DOCUMENT		Purchase order, Technical specification of BHEL, BHEL approved drawings/documents/Datasheet,QAP, Consumables certificates and any special requirements	R
2. Materials	Sheet, Channels & Frame, Brought out items etc.	Material test certificates, Inspection authority stamp correlation with material & TPI stamp verification, manufacturer guarantee certificate and routine test report	R
		If any specific / additional test requirements	R
3. In process inspection	Fabrication of JB	Dimension, Straightness, Drilling and weld quality	R
	Assembly of JB	Dimension, Straightness, opening, Door clearance , mounting arrangement	R
	Painting of JB and finishing	Surface treatment, paint quality, finish colour, shade and thickness	R
	Wiring	Arrangement of terminal blocks	R
5. Final inspection	Physical check	JB dimension, rating, mounting arrangement , cable entries, IP class and voltage rating vs approved datasheet, Sheet Gauge.	W
		Name plate for correct entries of Model No. Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc.	W
		Cable entry and terminal block size and type of cable gland used	W
		Make of JB, sub component and accessories	W
		Paint quality , finish colour, shade and thickness	W
	Document check	Material test certificate for all type of materials used, Painting quality test certificate, IP class test certificate, gasket certificate, BIS License copy if applicable, Test certificates from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS for flame proof item, Guarantee/Warranty certificate.	R
		Routine test certificates like HV Test, Insulation measurement before & after HV test, Secondary current injection test if applicable.	W
6. Packing & despatch	Packing	Soundness of packing, preservation & documentation as per specification.	V
		Marking of packing for easy identification	V
	Dispatch	Format of Packing slip & quantity as per scope of supply	V
Abbreviations used : R- Review, W- Witness, V- Verify			

बी एच ई एल BHEL		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD -32		Annexure-VII to PY55229 Rev 00 Page 08 of 10	
MINIMUM INSPECTION REQUIREMENT					
POWER SOCKET					Action By BHEL
1. DOCUMENT			Purchase order, Technical specification of BHEL, BHEL approved drawings/documents/Datasheet,QAP, Consumables certificates and any special requirements		R
2. Materials	Sheet, PVC cables/ wire, Channels & Frame, Brought out items etc.		Material test certificates, Inspection authority stamp correlation with material & TPI stamp verification, manufacturer guarantee certificate and routine test report		R
			If any specific / additional test requirements		R
3. In process inspection	Fabrication of socket		Dimension, Straightness, Drilling and weld quality		R
	Assembly of Socket		Dimension, Straightness, opening, Door clearance , mounting arrangement		R
	Painting of Socket and finishing		Surface treatment, paint quality, finish colour, shade and thickness		R
	Wiring		Arrangement of terminal blocks, wiring continuity, clamping, Ferrules terminals and Tag provision		R
5. Final inspection	Physical check		Socket rating, internal arrangement of components & wiring, mounting arrangement , cable entries, IP class and voltage rating vs approved datasheet.		W
			Name plate for correct entries of Model No. Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc.		W
			Cable entry and terminal block size and type of cable gland used		W
			Make of Socket, sub component and accessories		W
			Paint quality, finish colour, shade and thickness		W
	Functional check		Circuit functional check, continuity check.		W
			Plug & Socket interlocking check		W
	Document check		Material test certificate for all type of materials used, Painting quality test certificate, IP class test certificate, BIS License copy if applicable, Test certificates from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS for flame proof item, Guarantee/Warranty certificate.		R
			Routine test certificates like HV Test, Insulation measurement before & after HV test, Secondary current injection test if applicable.		W
6. Packing & dispatch	Packing		Soundness of packing, preservation & documentation as per specification.		V
			Marking of packing for easy identification		V
	Dispatch		Format of Packing slip & quantity as per scope of supply		V
Abbreviations used : R- Review, W- Witness, V- Verify					



MINIMUM INSPECTION REQUIREMENT

POLES			Action By BHEL
1. DOCUMENT		Purchase order, Technical specification of BHEL, BHEL approved drawings/documents/Datasheet,QAP, Consumables certificates and any special requirements	R
2. Materials	Pipe	Material test certificates, Inspection authority stamp correlation with material & TPI stamp verification, manufacturer guarantee certificate and routine test report	R
		If any specific / additional test requirements	R
3. In process inspection	Fabrication of Pole	Dimension, Straightness, Drilling and weld quality	R
	Assembly of Pole	Dimension, Straightness, Rigidity of different section joint	R
	Painting of Pole and finishing	Surface treatment, paint quality, finish colour, shade and thickness	R
5. Final inspection	Physical check	Dimension, assemble Check of different components, finishing	W
		Sub component like JB/Marshalling box Classification details (i.e. FLP/WP etc.) IP class and voltage range etc.	W
		Marshalling Box/JB Cable entry and terminal block size and type of cable gland used	W
		Make of JB/Marshalling box, sub component and accessories	W
		Paint quality, finish colour, shade and thickness	W
	Document check	Material test certificate for all type of materials used, routine test certificate, Painting quality test certificate. For JB/ Marshalling Box - IP class test certificate, BIS License copy if applicable, Test certificates from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS for flame proof item, Guarantee/Warranty certificate.	R
		For JB/Marshalling box:- Routine test certificates like HV Test, Insulation measurement before & after HV test, Secondary current injection test, if applicable	R
6. Packing & dispatch	Packing	Soundness of packing, preservation & documentation as per specification.	V
		Marking of packing for easy identification	V
	Dispatch	Format of Packing slip & quantity as per scope of supply	V

Abbreviations used : R- Review, W- Witness, V- Verify



MINIMUM INSPECTION REQUIREMENT

MISC. ITEM			Action By BHEL
1. DOCUMENT		Purchase order, Technical specification of BHEL, BHEL approved drawings/documents/Datasheet,QAP, Consumables certificates and any special requirements	R
2. Materials		Material test certificates, Inspection authority stamp correlation with material & TPI stamp verification, manufacturer guarantee certificate and routine test report	R
		If any specific / additional test requirements	R
3. In process inspection	Fabrication	Dimension, Straightness, Drilling and weld quality	R
	Assembly	Dimension, Straightness, opening, Door clearance , mounting arrangement	R
	Painting and finishing	Surface treatment, paint quality, finish colour, shade and thickness	R
	Wiring	Arrangement of terminal blocks, wiring continuity, clamping, Ferrules terminals and Tag provision	R
5. Final inspection	Physical check	Rating, internal arrangement of components & wiring, mounting arrangement , cable entries, IP class and voltage rating vs approved datasheet.	W
		Name plate for correct entries of Model No. Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc.	W
		Cable entry and terminal block size and type of cable gland used	W
		Make of main item, sub component and accessories	W
		Paint quality, finish colour, shade and thickness	W
	Functional check	Circuit functional check, continuity check.	W
	Document check	Material test certificate for all type of materials used, Painting quality test certificate, IP class test certificate, BIS License copy if applicable, Test certificates from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS for flame proof item, Guarantee/Warranty certificate.	R
		Routine test certificates like HV Test, Insulation measurement before & after HV test, Secondary current injection test if applicable.	W
6. Packing & dispatch	Packing	Soundness of packing, preservation & documentation as per specification.	V
		Marking of packing for easy identification	V
	Dispatch	Format of Packing slip & quantity as per scope of supply	V
Abbreviations used : R- Review, W- Witness, V- Verify			

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Ref. Doc		COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company. ANNEXURE –VIII (INSPECTION CHECK LIST FORMAT)		

		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD -32								Annexure-VIII to PY55229 Rev 00 Page 02 of 06	
INSPECTION CHECK LIST FOR LIGHTING FIXTURE											
BHEL PO NO :											
Item PO.SL.No.											
PROJECT											
Description of Item											
Qty											
Referred BHEL Spec. NO.											
Referred Approved datasheet No.											
Name of the inspector											
Date of Inspection											
	Points to check during Inspection in addition to applicable QAP/ IS requirements :					Inspector remarks				Inspector signature/date	
I	Physical Checks :										
1	Check availability of applicable spec. & approved datasheet (Approved as Code 1 or Code-2 by BHEL). Please note that item not to be inspected without stamped and signed approved datasheet from BHEL.										
2	Physical check of Fixture along with all components like internal & external reflector, Gasket, wire guard, Glass/acrylic cover, mounting arrangement , cable entries, IP class, and voltage range etc. as per approved datasheet. Check the lamp holder type(i.e. Bi pin or screw type) is as per approved datasheet and suitable for lamp.										
3	Check the paint shed of fixture including accessories and quality of painting as per approved datasheet.										
4	Physical check of Material composition, dimension and thickness of enclosure, reflector etc. as mentioned in the datasheet. Also check finishing of end product.										
5	Physical check that accessories like cable glands are of approved make as per sub vendor list or BHEL. Spec.										
6	Physical verification of name plate for correct entries of Model No. Type, Classification details (i.e . FLP/WP etc.) IP class and voltage range etc.										
7	Suitability check of lamp for proper fitment to the fixture.										
8	Quantity check for loose accessories to be supplied along with fixture as per supply BOQ listed in datasheet.										
9	Check the size and type of Cable gland as per approved datasheet if applicable (i.e. FLP or safe area DC Brass suitable for 3Cx2.5 sqmm cu. Armoured cable)										
10	Suitability check of Cable gland with fixture cable entry if applicable										
11	Physical Check of DC to AC convertor along with it's enclosure for proper fitment and internal wiring(Applicable for DC Fixture with CFL Lamp)										
12	Suitability check of cable gland with Converter enclosure cable entry (Applicable for DC Fixture with CFL Lamp)										
13	Physical Check of Control gear box for proper type suitable for fixture (Applicable for Non integral type fixture)										
14	Suitability check of cable gland with CG box cable entry (Applicable for Non integral type fixture)										
15	Physical check of blanking plug (Aluminum) for proper fitment with Fixture enclosure, CG box cable entry if applicable.										
16	Physical check of terminal block for proper size suitable for terminating of two nos. 2.5 sqmm cu. Wire.										
17	Review of test certificate from CIMFR or equivalent laboratory, certified by NABL & approved from PESO/DGMS(details as mentioned in approved data sheet), for fixture, CG box and enclosure of converter as applicable(Applicable for Flame proof items only).										
18	Review of test certification for weather proof fixture, CG box and enclosure of converter as applicable(Applicable for weather proof items only with minimum IP52 protection).										
19	Physical verification of packing slip (For all line items including accessories to be supplied in loose.).										
20	Physical check of packing of all items including accessories are as per packing method mentioned in the illumination spec.										
II	Functional checks :										
1	Functional check on suitability of fixture and lamp for rated Supply voltage along with accessories like ballast CG box etc. .										
2	Functional check on suitability of DC convertor for rated DC voltage of project and lamp .(Applicable for DC Fixture with CFL Lamp)										



**BHARAT HEAVY ELECTRICALS LIMITED
HYDERABAD -32**

Annexure-VIII to PY55229

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INSPECTION CHECK LIST FOR JUNCTION BOX

BHEL PO NO :											
Item PO.SL.No.											
PROJECT											
Description of Item											
Qty											
Referred BHEL Spec. NO.											
Referred Approved datasheet No.											
Name of the inspector											
Date of Inspection											

	Points to check during Inspection in addition to applicable QAP/ IS requirements :	Inspector remarks	Inspector signature/date
1	Physical Checks :		
1	Check availability of applicable spec. & approved datasheet (Approved as Code 1 or Code-2 by BHEL). Please note that item not to be inspected without stamped and signed approved datasheet from BHEL.		
2	Physical check of Junction box along with all components like terminal blocks, external canopy(if applicable), Gasket etc. as per approved datasheet.		
3	Physical check of mounting arrangement , cable entries, IP class, and voltage range, etc. as per approved datasheet.		
4	Physical check of Material composition, dimension and thickness of enclosure, canopy(if applicable) etc. as mentioned in the datasheet. Also check finishing of end product.		
5	Check the paint shed of junction box including canopy(if applicable) and quality of painting as per approved datasheet.		
6	Physical verification of availability of name plate for correct entries of Model No. manufacturer name, Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc as per approved datasheet.		
7	Physical verification of availability of external canopy for outdoor type JB and its assemble check with JB(Applicable for outdoor type JB only).		
8	Quantity check for loose accessories to be supplied along with lighting JB as per supply BOQ listed in datasheet.		
9	Check the make, size and type of Cable gland (i.e. FLP, Double compression brass)as per approved data sheet. Please note Cable gland shall be of approved make as per sub vendor list or as mentioned in the Illumination spec.		
10	Suitability check of Cable gland with cable entries at Junction box.		
11	Physical check of blanking plug (Aluminum) for proper fitment with Junction box cable entry.		
12	Physical check of Make, type & size of terminal block as per approved datasheet. Please note terminal block shall be of approved make as per sub vendor list or as mentioned in the Illumination spec.		
13	Review of test certificate from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS(details as mentioned in approved data sheet) (Applicable for Flame proof items only).		
14	Review of test certification for weather proof outdoor type JB (Applicable for weather proof items only with minimum IP52 protection).		
15	Physical verification of packing slip (For all line items including accessories to be supplied in loose.).		
16	Physical check of packing of all items including accessories are as per packing method mentioned in the illumination spec.		

		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD -32								Annexure-VIII to PY55229 Rev 00 Page 04 of 06	
INSPECTION CHECK LIST FOR POWER SOCKET AND RECEPTACLE											
BHEL PO NO :											
Item PO.SL.No.											
PROJECT											
Description of Item											
Qty											
Referred BHEL Spec. NO.											
Referred Approved datasheet No.											
Name of the inspector											
Date of Inspection											
Points to check during inspection in addition to applicable QAP/IS requirements :						Inspector remarks				Inspector signature/date	
I		Physical Checks :									
1		Check availability of applicable spec. & approved datasheet (Approved as Code 1 or Code-2 by BHEL). Please note that item not to be inspected without stamped and signed approved datasheet from BHEL.									
2		Physical check of Power sockets along with all components like MCB, Plug assembly, external canopy(if applicable), Gasket etc. as per approved datasheet.									
3		Physical check of mounting arrangement , cable entries, IP class, and voltage range, etc. as per approved datasheet.									
4		Physical check of Material composition, dimension and thickness of enclosure, canopy(if applicable) etc. as mentioned in the datasheet. Also check finishing of end product.									
5		Check the paint shed of Socket/Receptacle including accessories and quality of painting as per approved datasheet.									
6		Physical verification of availability of name plate for correct entries of Model No. manufacturer name, Type, Classification details (i.e. FLP/WP etc.) IP class and voltage /Current rating etc. as per spec.									
7		Physical verification of availability of external canopy for outdoor type Socket/Receptacle (If asked in Datasheet) and its assembly check with Socket enclosure.(Applicable for outdoor type Socket/Receptacle only).									
8		Quantity check for loose accessories to be supplied along with Socket/Receptacle as per supply BOQ listed in datasheet.									
9		Check the make, size and type of Cable gland (i.e. FLP, Double compression brass) as per approved data sheet. Please note that Cable gland shall be of approved make as per sub vendor list or as mentioned in the vendor list/Illumination spec.									
10		Suitability check of Cable gland with Socket/Receptacle cable entry for proper fitment.									
11		Check interlocking arrangement of plug & socket (If asked in the data sheet).									
12		Physical check of blanking plug (Aluminum) for proper fitment with Socket/receptacle cable entry.									
13		Physical check of size of terminal block as per approved datasheet.									
14		Review of test certificate from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS (details as mentioned in approved data sheet) (Applicable for Flame proof items only).									
15		Review of IP class test certification for weather proof outdoor type Socket/Receptacle(Applicable for weather proof items only with minimum IP52 protection).									
16		Physical verification of packing slip (For all line items including accessories to be supplied in loose).									
17		Physical check of packing of all items including accessories as per packing method mentioned in the illumination spec.									

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INSPECTION CHECK LIST FOR LIGHTING POLE											
BHEL PO NO :											
Item PO.SL.No.											
PROJECT											
Description of Item											
Qty											
Referred BHEL Spec. NO.											
Referred Approved datasheet No.											
Name of the inspector											
Date of Inspection											
	Points to check during inspection in addition to applicable QAP/ IS requirements :					Inspector remarks				Inspector signature/date	
I	Physical Checks :										
1	Check availability of applicable spec. & approved datasheet (Approved as Code 1 or Code-2 by BHEL). Please note that item not to be inspected without stamped and signed approved datasheet from BHEL.										
2	Physical check of Poles along with all components like GI Pipe, Marshalling/Junction Box, arm, Swan neck, reducer, coupler etc. as per approved datasheet.										
3	Physical check of mounting arrangement , cable entries, IP class of marshalling /Junction box (for Street/Flood lighting pole) as per approved datasheet.										
4	Physical check of Material composition, dimension and thickness of different section of poles, accessories (as applicable) etc. as mentioned in the datasheet. Also check finishing of end product.										
	Physical check of availability of cable entry holes at different locations in the poles as per approved datasheet. Also check the size of holes for their suitability of required usage.										
5	Check the painting of poles and Marshalling box/ Junction box including canopy(if applicable) and quality of painting as per approved datasheet or Illumination spec.										
6	Physical verification of availability of name plate in the Marshalling box/Junction box for correct entries of Model No. manufacturer name, Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc (Applicable for street & Flood lighting poles)										
7	Physical verification of availability of external canopy for marshalling box/ JB (if asked in datasheet)(Applicable for street & Flood lighting poles).										
8	Quantity check for loose accessories to be supplied along with Poles as per supply BOQ listed in datasheet.										
9	Check the make, size and type of Cable gland (i.e. FLP, Double compression brass) to be supplied along with marshalling box/Junction box as per approved datasheet(Applicable for street & Flood lighting poles). Please note Cable gland shall be of approved make as per sub vendor list or as mentioned in the Illumination spec.										
10	Suitability check of Cable gland with cable entries at Marshalling/Junction box (Applicable for street & Flood lighting poles).										
11	Physical check of blanking plug (Aluminum) for proper fitment with Marshalling/Junction box cable entry (Applicable for street & Flood lighting poles).										
12	Physical check of Make, type & size of terminal block in the marshalling/Junction box as per approved datasheet (Applicable for street & Flood lighting poles).Please note terminal block shall be of approved make as per sub vendor list or as mentioned in the Illumination spec.										
13	Review of test certificate from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS (details as mentioned in approved datasheet) (Applicable for Flame proof items only).										
14	Review of test certification for weather proof Marshalling/ Junction box (Applicable for street & Flood lighting poles).										
15	Physical verification of packing slip (For all line items including accessories to be supplied in loose.).										
16	Physical check of packing of all items including accessories as per packing method mentioned in the illumination spec.										
II	Assembly checks :										
1	Assemble the different part of poles and check for alignment and suitability of each parts of pole as per approved datasheet.										
2	Check for suitability of fitment different type of reducer (to be supplied against different type of fixture) to lighting pole Swan neck end (reducer 50/20). (Applicable for 2M, 3.75 & 4.75M pole with swan neck).										

		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD -32							Annexure-VIII to PY55218 Rev 00 Page 06 of 06	
INSPECTION CHECK LIST FOR MISC. ITEMS										
BHEL PO NO :										
Item PO.SL.No.										
PROJECT										
Description of Item										
Qty										
Referred BHEL Spec. NO.										
Referred Approved datasheet No.										
Name of the inspector										
Date of Inspection										
	Points to check during Inspection in addition to applicable QAP/ IS requirements :						Inspector remarks			Inspector signature/date
I	Physical Checks :									
1	Check availability of applicable spec. & approved datasheet (Approved as Code 1 or Code-2 by BHEL).									
2	Physical check the items alongwith all components for technical compatibility as per approved datasheet and Illumination spec.									
3	Physical check of Material composition, thickness, dimension, shape etc. as mentioned in the datasheet . Also check finishing of end product.									
4	Check the paint shed of items (if applicable) and quality of painting as per approved datasheet.									
5	Physical verification of availability of name plate for correct entries of Model No. manufacturer name, Type, Classification details (i.e. FLP/WP etc.) IP class and voltage range etc (If applicable).									
6	Suitability check of all sub component of the item (If applicable).									
7	Quantity check for loose accessories to be supplied along with the item as per supply BOQ listed in the datasheet.									
8	Check the make, size and type of Cable gland (i.e. FLP, Double compression brass) if supplied as per approved datasheet. Please note Cable gland shall be of approved make as per sub vendor list or as mentioned in the Illumination spec.									
9	Suitability check of Cable gland with cable entries of equipment (If applicable).									
10	Physical check of Make, type & size of terminal block as per approved datasheet. Please note terminal block shall be of approved make as per sub vendor list or as mentioned in the Illumination spec.									
11	Review of test certificate from CIMFR or equivalent laboratory certified by NABL & approved from PESO/DGMS(details as mentioned in approved data sheet) (Applicable for Flame proof items only).									
12	Review of test certification for weather proof (Applicable for weather proof items only with minimum IP52 protection).									
13	Physical verification of packing slip (For all line items including accessories to be supplied in loose).									
14	Physical check of packing of all items including accessories as per packing method mentioned in the illumination spec.									
II	Functional checks :									
1	Functional check to be carried out on items like 24 V Module & Hand lamp, Remote Emergency light etc. to ascertain their suitability of intended use.									
II	Assembly checks :									
1	Assembly check to be carried out on items like METSEC channel to ascertain the alignment and suitability of different component/accessories for intended use.									

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Ref. Doc		COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company. ANNEXURE –IX (TYPICAL PACKING SLIP FORMAT)		

	BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD -32					Annexure-IX to PY55229	
						Rev 00	
	PACKING SLIP FORMAT						
Project Name							
PO No. & Date :-							
Consignment No. & Date :-							
1	2	3	4	5	6	7	8
PO SL NO	ITEM DESCRIPTION	TYPE OF PACKING	Identification No. Of the Packing	Qty/pack	Total Qty supplied	NO Of Packet	Remarks
SUMMERY							
NO. OF CARTOON BOX							
NO. OF GUNNY BAG							
NO. OF BUNDLE OF POLES/CONDUIT							
NOTE:							
1. In packing detail at column 3 write type of the Packing used (i.e.Cartoon box, Gunney Bag, Bundle.etc.).							
2. In packing detail at column 4 write identification nos. of the Packing (i.e. PO NO/1,2,3....etc.).							
3. If item supplied as loose write only Identification no. assign to whole lot at column - 4 and write"loose supplied " in remarks column.							
4. Write qty of item packed in a Packet at column 5.							Vendor's sign with stamp
5. Write total qty. of item supplied at column 6.							
6. Write total no. of packet used for packing the supplied item at column 7.							
7. Write any special remarks in the remarks column at 8 (i.e. Acessories of item etc.)							
8. Loose items shall be quantified/numbered/tagged and not merely mentioned as "ONE LOT of loose. items							
9. Packing list of shelf life items shall have "Shelf li fe items" as header and mention of shelf life period of each item reflected in it							

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		ANNEXURE –X (GUIDE LINES FOR PREPARATION OF QUALITY ASSURANCE PLAN)		
Ref. Doc				

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. QAP GUIDELINES & FORMAT (ANNEXURE -) The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement. Note : 1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of detailed QAP for BHEL /CUSTOMER approval. 2. No deviation to Typical /Indicative /Standard QAP is acceptable.				

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**GUIDELINES TO VENDORS FOR
PREPARATION OF QUALITY ASSURANCE PLAN**

1. QAP shall be made in landscape mode on A4 size paper as per the format enclosed.
Font size shall be minimum 10.
2. Each page of QAP shall contain the following information.
 - a) Vendor's name & address.
 - b) Customer: BHEL, Hyderabad.
 - c) Project.
 - d) BHEL Product Standard Number/revision number as referred in P.O.
 - e) BHEL Purchase Order Number & Date.
 - f) Product as per P.O. description.
 - g) QAP Number (unique and shall not repeat)/revision number/date.
 - h) Page number and number of pages
3. QAP shall contain four parts / stages as follows.
 - a) Raw materials and bought out items.
 - b) In process Control / Inspection.
 - c) Final assembly, Inspection & Testing.
 - d) Painting, preservation & packing.
4. Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc).
5. Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.)
6. Under 'Class', indicate minor, major or critical depending on the importance of characteristic.
7. Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.)
8. Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.)
9. Under 'Reference document' and 'Acceptance norms', appropriate National & International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review & approval by our Engineering dept.
10. Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.
11. Please refer 'Agency' in QAP format.
Under P: Perform, W: Witness, V: Verify
Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR

Ref. Doc

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		2: (Vendor / Sub vendor) Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, under Witness (W) column use 1. Under 'Verify' column, use code 1. 12. Under 'D' please put (☐ Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification. 13. Vendor's signature & stamp should be available on each page of QAP. 14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings. 15. The following operations/characteristics/check points may be included (AS APPROPRIATE) a) Visual check b) Dimensional check c) Mechanical and Chemical properties. d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. f) Check for correctness for all components mounted as per General arrangement Drawing, Bill Of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc. g) Verification of test certificate for protection class for the enclosures. h) Mechanical functioning of switches. i) Continuity of earthing and provision of earth points. j) Colour coding of wiring, size, tightness & dressing of wiring. k) Review of test certificates of assembled items, raw materials, internal test reports etc. l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non Destructive Tests. p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating) q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. r) Packing and Preservation. 16. QAP Format enclosed. 17. Typical Manufacturing QAP is attached.		
	Ref. Doc			

VENDOR'S NAME & ADDRESS:			MANUFACTURING QUALITY PLAN						QP. NO.:				
			CUSTOMER: BHEL, HYDERABAD – 32.			BHEL P.O.NO.:			REV NO:		DATE:		
			PROJECT: PRODUCT:			P.O.DATE: BHEL SPEC:			REV:		PAGE 1 OF 1		
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
1.0	RAW MATERIALS & BOUGHT OUT ITEMS												
2.0	INPROCESS INSPECTION												
3.0	FINAL INSPECTION & TESTING												
4.0	PRESERVATION & PACKING												

VENDOR TO NOTE: THIS FORMAT IS IN MICROSOFT WORD. HEADER & FOOTER SHALL BE AVAILABLE IN EACH PAGE OF QP. QP SHALL BE IN LANDSCAPE & A4 SIZE ONLY. FONT SIZE SHALL BE MIN 10. VENDOR SHALL SIGN & STAMP IN EACH PAGE OF QP. LOI REF. & DATE ARE NOT ACCEPTABLE. P.O.NO. & DATE SHALL BE INDICATED. QP NO. SHOULD BE UNIQUE AND SHALL NOT REPEAT. ALL THE TESTS / CHECKS INDICATED IN THE BHEL SPEC. SHALL BE INDICATED IN THE QP.

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY	APPROVED BY	APPROVED BY
	VENDOR'S SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP