GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
SEMI-CONDUCTOR LABORATORY (SCL)
CHANDIGARH

Tender for SITC of electrical distribution system including illumination, MCC Panels, fire detection system, LAN, Paging etc. for the Chemical Store building at SCL

Bids to be submitted online

Tender No.: SCL/PurUnit-4/SC202100003201 dated 07-09-2021

A. Tender Details

Tender No :	**SCL/PurUnit-4/SC202100003201**
Tender Date :	**07-09-2021**
Tender Classification:	**GOODS**
Purchase Entity :	**PurUnit-4**
Centre :	**SEMI-CONDUCTOR LABORATORY (SCL)**

Procurement of SITC of electrical distribution system including illumination, MCC Panels, fire detection system, LAN, Paging etc. for the Chemical Store building at SCL

This tender is proposed as a DOMESTIC PUBLIC TENDER. This tender is restricted only to Class-I and Class-II Local Suppliers as defined under DPIIT Order dated 04/06/2020- Preference to Make in India Order-2017 Revision. Non-Local Suppliers need not quote.

Foreign OEMs/Agents quoting on behalf of Foreign OEMs are not permitted to quote. High Sea Sales Quotes not permitted. The bids shall be in INR only.

Purchase preference to eligible vendors are applicable as per extant notifications issued by the Government of India.

The Class-I/Class-II Local suppliers, at the time of submitting their offer, shall also indicate percentage of local content and provide self-certification that the item (s) offered meets the local content requirement for Class-I/Class-II Local Suppliers as the case may be. They shall also give details of location (s) at which the local value addition is made.

In cases if the item(s) offered exceed Rs. 10 Crores, the Class-I/Class-II Local Suppliers shall provide a Certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

False Declarations will be in breach of the Code of Integrity under Rule 175 (1) (i) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule

151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Technical Bids will be opened at the scheduled due date & time. No further intimation will be sent in this regard. The schedule for price bid opening shown is only indicative. Price bids will only be opened in the case of parties who have been techno-commercially accepted, the details of which will be communicated at a later stage.

Parties interested to participate in this e-Tender are required to register themselves as vendors, if not already registered, in our e-procurement portal https://eproc.vssc.gov.in by downloading plugins and help demos listed on the home page of the e-procurement link mentioned above to complete the vendor registration process. Paries can seek help from help desk +91471 2565 454/2527 (Email: eproc@vssc.gov.in) also the home page of e-procurement portal may be accessed for any technical help for registration and subsequent process. Parties may please note that without registering in our E-procurement portal they will not be able to quote for this tender.

A.1 Tender Schedule

Bid Submission Start Date :	**03-09-2021 17:00**
Bid Clarification Due Date :	**28-09-2021 17:30**
Bid Submission Due Date :	**04-10-2021 11:00**
Bid Opening Date :	**04-10-2021 11:30**
Price Bid Opening Date :	**15-10-2021 11:30**

B. Tender Attachments

Technical Write-up/Drawings

Document : Specification

Document : ISRO Safety Manual

Document : Panel SLD

Document : Approved panel manufacturer list

Instructions To Vendors

5. INSTRUCTIONS TO TENDERERS AND TERMS CONDITIONS OF TENDER

1. Bid shall be submitted on-line only complying specified schedule.

2. Late tenders and delayed tenders will not be considered.

3. GST and/or other duties/levies legally leviable and intended to be claimed should be distinctly shown separately in the tender.

4. a)All available technical literature, catalogues and other data in support of the specifications and details of the items should be furnished along with the offer.
b)Samples, if called for, should be submitted free of all charges by the tenderer and the Purchaser shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of non acceptance of tender, the tenderer will have to remove the samples at his own expense.
c)Approximate net and gross weight of the items offered shall be indicated in your offer if available. If dimensional details are available the same should also be indicated in your offer.
(d) Specifications: Stores offered should strictly confirm to our specifications. Deviations, if any, should be clearly indicated by the tenderer in his quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples, wherever necessary, along with the quotations. Test Certificates, wherever necessary, should be forwarded along with supplies. Wherever options have been called for in our specifications, the tenderer should address all such options. Wherever specifically mentioned by us, the tenderer could suggest changes to specifications with appropriate response for the same.

5. The purchaser shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portions of the quantity offered and the

tenderers shall supply the same at the rates quoted.

6. The tenderer should supply along with his tender, the name of his bankers as well as the latest Income-Tax clearance certificate duly countersigned by the Income-Tax Officer of the Circle concerned under the seal of his office, if required by the Purchaser.

7. The authority of the person signing the tender, if called for, should be produced.

8. In case of any difference between General Terms & Conditions enclosed and Terms & Conditions specific to this tender i.e. technical specifications & Vendor Specified Terms, Terms and Conditions specific to this tender will prevail.

9. TERMS CONDITIONS OF TENDER

10. DEFINITIONS:
a.The term PURCHASER shall mean Semi-Conductor Laboratory, Sector-72, Mohali, Punjab-160071, under the administrative control of DOS, Government of India.
b.The term CONTRACTOR shall mean, the person, firm or company with whom or with which the order for the supply of stores is placed and shall be deemed to include the Contractor's successors, representative, heirs, executors and administrators unless excluded by the Contract.
c.The term STORES shall mean what the Contractor agrees to supply under the Contract as specified in the Purchase Order including erection of plants machinery and subsequent testing, should such a condition is included in the Purchase Order. The term PURCHASE ORDER shall mean the communication signed on behalf of the Purchaser by an Officer duly authorised intimating the acceptance on behalf of the Purchaser on the terms and conditions mentioned or referred to in the said communication accepting the tender or offer of the Contractor for supply of stores or plant, machinery or equipment or part thereof.

11. PRICES:
Tender offering firm prices will be preferred. Where a price variation clause is insisted upon by a tenderer, quotation with a reasonable ceiling should be submitted. Such offers should invariably be supported by the base price taken into account at the time of tendering and also the formula for any such variation/s.

12. PACKING FORWARDING INSURANCE:
The Contractor will be held responsible for the stores being sufficiently and properly packed for transport by rail, road, sea or air to withstand transit hazards and ensure safe arrival at the destination. The packing and marking of packages shall be done by and at the expense of the Contractor. The purchaser will not pay separately for transit insurance, all risks in transit being exclusively of the Contractor and the Purchaser shall pay only for such stores as are actually received in good condition in accordance with the Contract.

13. DESPATCH:
The Contractor is responsible for obtaining a clear receipt from the Transport Authorities specifying the goods dispatched. The consignment should be dispatched with clear Railway Receipt/Lorry Receipt. If sent in any other mode, it shall be at the risk of the Contractor. Purchaser will take no responsibility for short deliveries or wrong supply of goods when the same are booked on said to contain basis. Purchaser shall pay for only such stores as are actually received by them in accordance with the Contract.

14. TEST CERTIFICATE:
Wherever required, test certificates should be sent along with the dispatch documents.

15. ACCEPTANCE OF STORES:
a.The stores shall be tendered by the Contractor for inspection at such places as may be specified by the purchaser at the Contractor's own risk, expense and cost.
b.It is expressly agreed that the acceptance of the stores Contracted for, is subject to final approval by the purchaser, whose decision shall be final.
c.If, in the opinion of the purchaser, all or any of the stores do not meet the performance or quality requirements specified in the Purchase Order, they shall be rejected may be either rejected or accepted at a price to be fixed by the purchaser and his decision as to rejection and the prices to be fixed shall be final and binding on the Contractor.
d.If the whole or any part of the stores supplied are rejected in accordance with Clause No. 6 (c) above, the purchaser shall be at liberty, with or without notice to the Contractor, to purchase in the open market at the expense of the Contractor stores meeting the necessary performance and quality Contracted for in place of those rejected, provided that either the purchase, or the agreement to purchase, from another supplier is made within six months from the date of rejection of the stores as aforesaid.

16. REJECTED STORES:
Rejected stores will remain at destination at the Contractor's risk and responsibility. If instructions for their disposal are not received from the Contractor within a period of 14 days from the date of receipt of the advice of rejection, the purchaser or his representative has, at his discretion, the right to scrap or sell or consign the rejected stores to Contractor's address at the Contractor's entire risk and expense, freight being payable by the Contractor at actuals.

17. DELIVERY:
a.The time for and the date of delivery of the stores stipulated in the Purchase Order shall be deemed to be the essence of the Contract and delivery must be completed on or before the specified dates.

b.Should the Contractor fail to deliver the stores or any consignment thereof within the period prescribed for such delivery, the purchaser shall be entitled at his option either.
(i) to recover from the Contractor as agreed liquidated damages and not by way of penalty, a sum of

0.5% per week of the price of any stores which the Contractor has failed to deliver as aforesaid or during which the delivery of such store may be in arrears subject to a minimum of 10%, or

(ii) to purchase from elsewhere, without notice to the Contractor on the account and at the risk of the Contractor, the stores not delivered or others of a similar description (where others exactly complying with the particulars, are not, in the opinion of the purchaser, readily procurable, such opinion being final) without cancelling the Contract in respect of the consignment (s) not yet due for delivery, or

(iii) to cancel the Contract or a portion thereof and if so desired to purchase or authorise the purchase of stores not so delivered or others of a similar description (where others exactly if complying with the particulars are not, in the opinion of the purchaser, readily procurable, such opinion final) at the risk and cost of the Contractor.

In the event of action being taken under sub-clause (ii) (iii) of clause above, the Contractor shall be liable for any loss which the purchaser may sustain on that account, provided that the re-purchase or if there is an agreement to repurchase then such agreement is made within six months from the date of such failure. But the Contractor shall not be entitled to any gain on such re-purchase made against default. The manner and method of such re purchase shall be at the discretion of the purchaser, whose decision shall be final. It shall not be necessary for the purchaser to serve a notice of such re purchase on the defaulting Contractor. This right shall be without prejudice to the right of the purchaser to recover damages for breach of Contract by the Contractor.

18.
EXTENSION OF TIME:
As soon as it is apparent that the Contract dates cannot be adhered to, an application shall be sent by the Contractor to the purchaser. If failure, on the part of the Contractor, to deliver the stores in proper time shall have arisen from any cause which the purchaser may admit as reasonable ground for an extension of the time (and his decision shall be final) he may allow such additional time as he considers it to be justified by circumstances, of the case without prejudice to the purchaser's right to recover liquidated damages under clause 8 thereof.

19. ERECTION OF PLANT MACHINERY:
Wherever erection of a plant or machinery is the responsibility of the Contractor as per the terms of the Contract and in case the Contractor fails to carry out the erection as and when called upon to do so within the period specified by the purchaser, the purchaser shall have the right to get the erection done through any source of his choice. In such an event, the Contractor shall be liable to bear any additional expenditure that the purchaser is liable to incur towards erection. The Contractor shall, however, not be entitled to any gain due to such an action by the purchaser.

20. PAYMENT:
Contractor's bill will be passed for payment only after the stores have been received, inspected and

accepted by the Purchaser.

21. MODE OF PAYMENT:
Normally payment will be made for the accepted stores within 30 days from the date of receipt of the materials.

22. RECOVERY OF SUM DUE:
Whenever any claim for the payment of, whether liquidated or not, money arising out of or under this Contract against the Contractor, the purchaser shall be entitled to recover such sum by appropriating in part or whole, the security deposited by the Contractor, if a security is taken against the Contract. In the event of the security being insufficient or if no security has been taken from the Contractor, then the balance or the total sum recoverable as the case may be, shall be deducted from any sum then due or which at any time thereafter may become due to the Contractor under this or any other Contract with the purchaser. Should this sum be not sufficient to cover the full amount recoverable, the contractor shall pay to the purchaser on demand the remaining balance due. Similarly, if the purchaser has or makes any claim, whether liquidated or not, against the Contractor under any other Contract with the purchaser, the payment of all moneys payable under the Contract to the Contractor including the security deposit shall be withheld till such claims of the purchaser are finally adjudicated upon and paid by the Contractor.

23. INDEMNITY:
The Contractor shall warrant and be deemed to have warranted that all stores supplied against this Contract are free and clean of infringement of any Patent, Copyright or Trademark, and shall at all times indemnify the purchaser against all claims which may be made in respect of the stores for infringement of any right protected by Patent Registration of design or Trade mark and shall take all risk of accidents or damage which may cause a failure of the supply from whatever cause arising and the entire responsibility for sufficiency of all means used by him for the fulfillment of the contact.

24. COUNTER TERMS AND CONDITION OF SUPPLIERS:
Where counter terms and conditions printed or cyclostyled conditions have been offered by the supplier, the same shall not be deemed to have been accepted by the Purchaser, unless specific written acceptance thereof is obtained.

25. SECURITY FOR PURCHASE OF MATERIALS:
Successful tenderer will have to furnish in the form of a bank guarantee or any other form as called for by the purchaser towards adequate security for the materials and properties provided by the Purchaser for the due execution of the Contract.

C. Bid Templates

C.1 Technical Bid - SITC of electrical distribution system including illumination, MCC Panels, fire detection system, LAN, Paging etc. for the Chemical Store building at SCL

1. Installation of 415 V horizontal type MCB distribution board

Item specifications for Installation of 415 V horizontal type MCB distribution board

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	SITC of horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing, labelled ferruling etc. as required complete with RCBO/MCBs as per below: Incomer: 32A FP (3 Ph RCBO) Outgoing : 18 way , 5 No SP MCB (10A), 9 No. SP MCB (6 A), 4 No SP MCB (20A) Make: Siemens/Schneider/ ABB/Legrand/hager or equivalent.		-		

2. Supply of 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB), 3 phase, 415 V

Item specifications for Supply of 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB), 3 phase, 415 V

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of Pre-fabricated , IEC61439-2 with latest amendments, 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB) with I/C MCCB+ 8- O/G MCCBs, 3 phase, 415 V, floor mounted,/wall mounted having 160A, 4P (minimum 35kA) MCCB set@100A with numerical release for O/C, S/C and E/F for incomer and 3P, 40A, 25kA min MCCB with O/C and S/C as outgoings, suitable for wall mounting, with back supporting frame made of Channel/Angle, dust protected IP 54, duly powder coated, inclusive of 200 A, tinned copper bus bar, common neutral link, earth bar detailed as per attached specification and equivalent to L&T make SMDB Enersus-S eries. Make: Siemens/Schneider/ Legrand/L&T		-		

3. Installation of 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB), 3 phase, 415 V

Item specifications for Installation of 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB), 3 phase, 415 V

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation, testing and commissioning of Pre-fabricated , IEC61439-2 with latest amendments, 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB) with I/C MCCB+ 8- O/G MCCBs, 3 phase, 415 V, floor mounted,/wall mounted having 160A, 4P (minimum 35kA) MCCB set@100A with numerical release for O/C, S/C and E/F for incomer and 3P, 40A, 25kA min MCCB with O/C and S/C as outgoings, suitable for wall mounting, with back supporting frame made of Channel/Angle, dust protected IP 54, duly powder coated, inclusive of 200 A, tinned copper bus bar, common neutral link, earth bar detailed as per attached specification and equivalent to L&T make SMDB Enersus-S eries. Make: Siemens/Schneider/ Legrand/L&T		-		

4. Supply of 3.5Cx300 Sq. mm Aluminium conductor

5. Laying of 3.5Cx300 Sq. mm Aluminium conductor on existing wall/surface/Cable Tray

6. Supply of 4Cx70 Sq. mm Aluminium conductor

Item specifications for Supply of 4Cx70 Sq. mm Aluminium conductor

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of 4Cx70 Sq. mm Aluminium conductor, XLPE insulated, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I)		-		

7. Supply of 3 Phase 415 V MCC panel

Item specifications for Supply of 3 Phase 415 V MCC panel

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	as per IEC 61439 details as per SLD and specification attached.		-		

8. Installation, Testing and Comissioning of 3 Phase 415 V MCC panel 1

Item specifications for Installation, Testing and Comissioning of 3 Phase 415 V MCC panel 1

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation, Testing and Comissioning of 3 Phase 415 V MCC panel 1 as per IEC 61439 details as per SLD and specification attached. Make: As per DOS approved Panel list (attached). Item Code: 401411858		-		

9. Supply of horizontal 415 V MCB distribution board

Item specifications for Supply of horizontal 415 V MCB distribution board

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing, labelled ferruling etc. as required complete with RCBO/MCBs as per below: Incomer: 32A FP (3 Ph RCBO) Outgoing : 18 way , 5 No SP MCB (10A), 9 No. SP MCB (6 A), 4 No SP MCB (20A) Make: Siemens/Schneider/ ABB/Legrand/hager or equivalent.		-		

10. Laying of 3.5Cx300 Sq. mm Aluminium conductor direct in ground

Item specifications for Laying of 3.5Cx300 Sq. mm Aluminium conductor

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	including excavation, sand cushioning, protective covering and refilling the trench, including standard cable route marker etc. as required.		-		

11. Laying of 3.5Cx300 Sq. mm Aluminium conductor inin the existing RCC/ HUME/ METAL pipe as required.

12. Laying of 4Cx70 Sq. mm Aluminium conductor

Item specifications for Laying of 4Cx70 Sq. mm Aluminium conductor

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Laying of 4Cx70 Sq. mm Aluminium conductor XLPE insulated, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I) on existing wall/surface/Cable Tray.		-		
2	Make: Finolex/Havells/KEI/ Polycab/RPG/CCI or equivalent		-		
3	Note: Height of the building/overhead existing cable tray is approx. 5-6 meter. The cable shall be installed on surface on wall/soffit of ceiling as required.		-		

13. Supply of 4Cx10 Sq. mm Aluminium conductor

14. Laying of 4Cx10 Sq. mm Aluminium conductor on existing wall/surface/Cable Tray

15. Laying of 4Cx10 Sq. mm Aluminium conductor direct in ground

Item specifications for Laying of 4Cx10 Sq. mm Aluminium conductor

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	including excavation, sand cushioning, protective covering and refilling the trench, including standard cable route marker etc. as required.		-		

16. Laying of 4Cx10 Sq. mm Aluminium conductor in the existing RCC/ HUME/ METAL pipe as required.

17. Supply of 3Cx2.5 Sq. mm copper conductor

18. Laying of 3Cx2.5 Sq. mm copper conductor

19. Supply of 12Cx2.5 Sq. mm copper conductor

20. Laying of 12Cx2.5 Sq. mm copper conductor

21. Supply of 12 Pair instrument Cu cable

22. Laying of 12 Pair instrument Cu cable

23. Supply of end termination of 3.5Cx300 Sq. mm Aluminium cable

Item specifications for Supply of end termination of 3.5Cx300 Sq. mm Aluminium cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	with brass double compression gland and Aluminium/Cu lugs for following size XLPE insulated, extruded PVC inner sheath, Steel wire armoured and PVC outer sheathed 1.1 KV grade cable. Make: Dowells, 3M, Hex, Comat		-		

24. making of end termination of 3.5Cx300 Sq. mm Aluminium cable

Item specifications for making of end termination of 3.5Cx300 Sq. mm Aluminium cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	with brass double compression gland and Aluminium/Cu lugs for following size XLPE insulated, extruded PVC inner sheath, Steel wire armoured and PVC outer sheathed 1.1 KV grade cable. Make: Dowells, 3M, Hex, Comat		-		

25. Supply of end termination of 3.5Cx70 Sq. mm Aluminium cable

Item specifications for Supply of end termination of 3.5Cx70 Sq. mm Aluminium cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply and making of end termination with brass double compression gland and Aluminium/Cu lugs for 3.5Cx70 sq. mm size XLPE insulated, extruded PVC inner sheath, Steel wire armoured and PVC outer sheathed 1.1 KV grade cable. Make: Dowells, 3M, Hex, Comat		-		

26. making end termination of 3.5Cx70 Sq. mm Aluminium cable

Item specifications for making end termination of 3.5Cx70 Sq. mm Aluminium cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	making of end termination with brass double compression gland and Aluminium/Cu lugs for 3.5Cx70 sq. mm size XLPE insulated, extruded PVC inner sheath, Steel wire armoured and PVC outer sheathed 1.1 KV grade cable. Make: Dowells, 3M, Hex, Comat		-		

27. Supply of end termination of 4 Cx10 Sq. mm Aluminium

28. making of end termination of 4 Cx10 Sq. mm Aluminium

29. Supply of end termination of 3Cx2.5 Sq. mm copper conductor

30. making of end termination of 3Cx2.5 Sq. mm copper conductor

31. Supply of end termination of 12Cx2.5 Sq. mm copper conductor

32. making of end termination of 12Cx2.5 Sq. mm copper conductor

33. Supply of end termination of 12 Pair instrument Cu cable

34. making of end termination of 12 Pair instrument Cu cable

35. Supply of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting

Item specifications for Supply of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting as per IS 2206 with luminous efficiency 100Lm/watt or better, CRI > 0.8 & THD<10%, IP-66 as per IS/IEC 60529:2001, made of Die cast aluminium alloy, Heat resistant & tough clear dome glass, having enclosure: as per Ex-d, GAS Gr. IIA, IIB, IIC AS PER IS/IEC 60079-1:2007 & IS/IEC 60079-0:2004, Area of classification: ZONE-1, 2, 21 & 22 and temperature class T-6 or better as per IS/IEC 60079 complete with loop-in loop out provision and equivalent to FLPW-1095 of Balinga Make . Mounting bracket for mounting on the ceiling, Double compression cable gland and other accessories for smooth installation shall be provided and install by the contractor along with the light fitting. Recommended make of fixture: Baliga, Stahl, Sudhir Switchgear Note: Party to submit PESO certification along with Fixture and other accessories.		-		

36. Installation of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting

Item specifications for Installation of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting as per IS 2206 with luminous efficiency 100Lm/watt or better, CRI > 0.8 & THD<10%, IP-66 as per IS/IEC 60529:2001, made of Die cast aluminium alloy, Heat resistant & tough clear dome glass, having enclosure: as per Ex-d, GAS Gr. IIA, IIB, IIC AS PER IS/IEC 60079-1:2007 & IS/IEC 60079-0:2004, Area of classification: ZONE-1, 2, 21 & 22 and temperature class T-6 or better as per IS/IEC 60079 complete with loop-in loop out provision and equivalent to FLPW-1095 of Balinga Make . Mounting bracket for mounting on the ceiling, Double compression cable gland and other accessories for smooth installation shall be provided and install by the contractor along with the light fitting. Recommended make of fixture: Baliga, Stahl, Sudhir Switchgear Note: Party to submit PESO certification along with Fixture and other accessories.		-		

37. Supply of wall/ceiling mounted batten type 20W LED tube light luminaire with efficient driver

Item specifications for Supply of wall/ceiling mounted batten type 20W LED tube light luminaire with efficient driver

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of wall/ceiling mounted batten type 20W LED tube light (Four feet) luminaire with efficient driver (efficiency shall be more than 90%) & with minimum lumens output of 2000 lumens per lamp, comprising of nano diffuser technology complete with efficient & constant current output driver suitable for operation on 230V, single phase, 50Hz AC supply, efficient heat sink, effective thermal management and with colour temperature shall be > 6000K. The LED with suitable control gear and power factor >0.9. LM 79 certification for luminaire/LM80 certificate for LED shall be submitted and with other standard accessories, prewired including necessary interconnections complete in all respects and as directed by EIC. Recommended make of fixture: Philips, GE, Trilux, LT.		-		

38. Installation of wall/ceiling mounted batten type 20W LED tube light luminaire with efficient driver

Item specifications for Installation of wall/ceiling mounted batten type 20W LED tube light luminaire with efficient driver

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of wall/ceiling mounted batten type 20W LED tube light (Four feet) luminaire with efficient driver (efficiency shall be more than 90%) & with minimum lumens output of 2000 lumens per lamp, comprising of nano diffuser technology complete with efficient & constant current output driver suitable for operation on 230V, single phase, 50Hz AC supply, efficient heat sink, effective thermal management and with colour temperature shall be > 6000K. The LED with suitable control gear and power factor >0.9. LM 79 certification for luminaire/LM80 certificate for LED shall be submitted and with other standard accessories, prewired including necessary interconnections complete in all respects and as directed by EIC. Recommended make of fixture: Philips, GE, Trilux, LT.		-		

39. Supply of 1 or 2 Module GI box along with modular base and cover plate for modular switches

40. Instllation of 1 or 2 Module GI box along with modular base and cover plate for modular switches

41. Supply of 6 Module GI box along with modular base and cover plate for modular switches

42. Installation of 6 Module GI box along with modular base and cover plate for modular switches

43. Supply of 8 Module GI box along with modular base and cover plate for modular switches

44. Installation of 8 Module GI box along with modular base and cover plate for modular switches

45. Supply of 5/6 Amp modular switch

Item specifications for Supply of 5/6 Amp modular switch

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Legrand, L & T, ABB, Schneider, Hager or equivalent		-		

46. Installation of 5/6 Amp modular switch

Item specifications for Installation of 5/6 Amp modular switch

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Legrand, L & T, ABB, Schneider, Hager or equivalent		-		

47. Supply of 5/6 Amp modular socket

Item specifications for Supply of 5/6 Amp modular socket

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Legrand, L & T, ABB, Schneider, Hager or equivalent		-		

48. Installation of 5/6 Amp modular socket

Item specifications for Installation of 5/6 Amp modular socket

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Legrand, L & T, ABB, Schneider, Hager or equivalent		-		

49. supply of 3 X 1.5 sq. mm wire along with conduit for wiring

Item specifications for supply of 3 X 1.5 sq. mm wire along with conduit for wiring

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Note: Item includes supply and installation of MS conduit and wire both. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

50. Installtion of 3 X 1.5 sq. mm wire along with conduit for wiring

Item specifications for Installtion of 3 X 1.5 sq. mm wire along with conduit for wiring

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Note: Item includes supply and installation of MS conduit and wire both. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

51. supply of 3 X 2.5 sq. mm wire along with conduit for wiring

Item specifications for supply of 3 X 2.5 sq. mm wire along with conduit for wiring

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Note: Item includes supply and installation of MS conduit and wire both. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

52. Installtion of 3 X 2.5 sq. mm wire along with conduit for wiring

Item specifications for Installtion of 3 X 2.5 sq. mm wire along with conduit for wiring

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Note: Item includes supply and installation of MS conduit and wire both. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

53. Supply of 20 A, 240 V, SPN Industrial type socket

Item specifications for Supply of 20 A, 240 V, SPN Industrial type socket

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 A, âCâ curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required. Make: Legrand, L & T, ABB, Anchor, Schneider		-		

54. Installation of 20 A, 240 V, SPN Industrial type socket

Item specifications for Installation of 20 A, 240 V, SPN Industrial type socket

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation of 20 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 A, âCâ curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required. Make: Legrand, L & T, ABB, Anchor, Schneider		-		

55. Supply of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan

Item specifications for Supply of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan suitable for operation on 230V, 50 Hz single phase AC supply complete with 3 core flexible copper conductor cable, gravity louvres shutters/ built in grill, bird guard and mounting arrangement and installation on wall including grouting of bolts for installation, supply of all materials, interconnections complete as required. Make: CG, Khaitan, Havells or equivalent		-		

56. Installation of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan

Item specifications for Installation of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan suitable for operation on 230V, 50 Hz single phase AC supply complete with 3 core flexible copper conductor cable, gravity louvres shutters/ built in grill, bird guard and mounting arrangement and installation on wall including grouting of bolts for installation, supply of all materials, interconnections complete as required . Make: CG, Khaitan, Havells or equivalent		-		

57. Supply of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch

Item specifications for Supply of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch made of Aluminium LM 6 Material with anticorrosive epoxy powder coated suitable for area zone 1 & 2, IP 66 or better along with glands. Make: Baliga, stahl, Sudhir Switchgear. or equivalent Note: Party to submit PESO certification for rotary switch.		-		

58. Installation of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch

Item specifications for Installation of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of following flame/explosion proof single phase double Pole 230V, 10 A, rotary switch made of Aluminium LM 6 Material with anticorrosive epoxy powder coated suitable for area zone 1 & 2, IP 66 or better along with glands. Make: Baliga, stahl, Sudhir Switchgear. or equivalent Note: Party to submit PESO certification for rotary switch.		-		

59. Supply of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable

Item specifications for Supply of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable along with glands and made of Aluminium LM 6 Material with anticorrosive epoxy powder coated suitable for area zone 1 & 2, IP 66 or better. Make: Baliga, stahl, Sudhir Switchgear. or equivalent Note: Party to submit PESO certification for rotary switch.		-		

60. Installation of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable

Item specifications for Installation of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable along with glands and made of Aluminium LM 6 Material with anticorrosive epoxy powder coated suitable for area zone 1 & 2, IP 66 or better. Make: Baliga, stahl, Sudhir Switchgear. or equivalent Note: Party to submit PESO certification for rotary switch.		-		

61. Supply of 50 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Item specifications for Supply of 50 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	50 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders or on surface including G.I. bolts & nuts, etc. as required. Make: L&T, Profab, Legrand, SIntex, OBO Bettermann		-		

62. Installing of 50 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Item specifications for Installing of 50 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installing of 50 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders or on surface including G.I. bolts & nuts, etc. as required.		-		

63. Supply of 100 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Item specifications for Supply of 100 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of 100 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders or on surface including G.I. bolts & nuts, etc. as required. Make: L&T, Profab, Legrand, SIntex, OBO Bettermann		-		

64. Installing of 100 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Item specifications for Installing of 100 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installing of 100 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders or on surface including G.I. bolts & nuts, etc. as required.		-		

65. Supply of 300 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Item specifications for Supply of 300 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of 300 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders or on surface including G.I. bolts & nuts, etc. as required. Make: L&T, Profab, Legrand, SIntex, OBO Bettermann		-		

66. Installation of 300 mm width X 50 mm depth X 1.6 mm thickness perforated, hot dipped Galvanised Iron cable tray

Item specifications for Installation of 300 mm width X 50 mm depth X 1.6 mm thickness perforated, hot dipped Galvanised Iron cable tray

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of 300 mm width X 50 mm depth X 1.6 mm thickness perforated, hot dipped Galvanized Iron cable tray		-		

67. Supply of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc.

Item specifications for Supply of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc.

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc. detailed specification as per the tender document.		-		

68. Installation of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc.

Item specifications for Installation of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc. detailed specification as per the tender document.		-		

69. Supply of 72W/75W LED Street Light fixture

Item specifications for Supply of 72W/75W LED Street Light fixture

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of 72W/75W LED Street Light fixture with High-brightness White LEDs sources with high transmittance flat toughed glass cover and peanut LENS detailed specification as per the tender document. Make of fixture: Trilux, Philips, GE, LT. Make of LED: NICHIA / CREE / PHILIPS/ LUMILED / OSRAM Note: The LED light fitting and its driver unit etc. shall have warranty for a period of 5 years from the date of acceptance.		-		

70. Installation of 72W/75W LED Street Light fixture

Item specifications for Installation of 72W/75W LED Street Light fixture

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of 72W/75W LED Street Light fixture with High-brightness White LEDs sources with high transmittance flat toughed glass cover and peanut LENS detailed specification as per the tender document. Make of fixture: Trilux, Philips, GE, LT. Make of LED: NICHIA / CREE / PHILIPS/ LUMILED / OSRAM Note: The LED light fitting and its driver unit etc. shall have warranty for a period of 5 years from the date of acceptance.		-		

71. Supply of G.I. tape 20 mm X 3 mm thick on parapet or surface of wall

Item specifications for Supply of G.I. tape 20 mm X 3 mm thick on parapet or surface of wall

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For horizontal run)	Yes / No / Explain		

72. Fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall.

Item specifications for Fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Horizontal run		-		

73. Fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required (for vertical run).

Item specifications for Fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required (for vertical run).

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For vertical run)		-		

74. Supply of testing joint, made of 20 mm X 3 mm thick G.I. strip

Item specifications for Supply of testing joint, made of 20 mm X 3 mm thick G.I. strip

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.		-		

75. Fixing testing joint, made of 20 mm X 3 mm thick G.I. strip

Item specifications for Fixing testing joint, made of 20 mm X 3 mm thick G.I. strip

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.		-		

76. Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod

Item specifications for Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod with necessary coupler and connector, universal clamps, inspection chamber, earth conductivity enhancing mineral compound of required quantity around the electrode in the excavated pit and providing earth chamber including necessary civil works also necessary holes, material to interconnect with earth strips complete as required as per IS 60364 and IS 3043 with latest amendments. Make: OBO Bettermann/ Terec/ Erico/ Loress/ Ashlok/JMV lps		-		

77. I/T/C of Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod

Item specifications for I/T/C of Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	I/T/C of Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod with necessary coupler and connector, universal clamps, inspection chamber, earth conductivity enhancing mineral compound of required quantity around the electrode in the excavated pit and providing earth chamber including necessary civil works also necessary holes, material to interconnect with earth strips complete as required as per IS 60364 and IS 3043 with latest amendments.		-		

78. Supply of 6 SWG dia G.I. wire

79. Fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.

80. Supply of 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode

Item specifications for Supply of 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)		-		

81. Laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode

Item specifications for Laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm)		-		

82. Supplying 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required

Item specifications for Supplying 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supplying 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required		-		

83. Fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required. -

Item specifications for Fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required. -

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.		-		

84. Supply of accessories for Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick

Item specifications for Supply of accessories for Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.		-		

85. Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick

Item specifications for Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required		-		

86. Supply 25 mm X 5 mm copper strip as strip earth electrode

Item specifications for Supply 25 mm X 5 mm copper strip as strip earth electrode

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)		-		

87. Laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode

Item specifications for Laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)		-		

88. Supply of 4 mm dia copper wire (Green yellow colour)

Item specifications for Supply of 4 mm dia copper wire (Green yellow colour)

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Providing 4 mm dia copper wire (Green yellow colour) for fixing on surface or in recess for loop earthing of motor, LPBS, cable Tray etc. with termination as required. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

89. Fixing 4 mm dia copper wire (Green yellow colour)

Item specifications for Fixing 4 mm dia copper wire (Green yellow colour)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Fixing 4 mm dia copper wire (Green yellow colour) on surface or in recess for loop earthing of motor, LPBS, cable Tray etc. with termination as required. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

90. Supply of 10 mm dia copper wire (Green yellow colour)

Item specifications for Supply of 10 mm dia copper wire (Green yellow colour)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Providing 10 mm dia copper wire (Green yellow colour) for fixing on surface or in recess for loop earthing of motor, LPBS, cable tray etc. with termination at both end as required. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI		-		

91. Fixing 10 mm dia copper wire (Green yellow colour) on surface or in recess for loop

earthing of motor

Item specifications for Fixing 10 mm dia copper wire (Green yellow colour) on surface or in recess for loop earthing of motor

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Fixing 10 mm dia copper wire (Green yellow colour) on surface or in recess for loop earthing of motor, cable tray etc. with termination at both end as required. Make: Finolex/Havells/KEI/ Polycab/RPG/CCI.		-		

92. Supply of ISI mark 300mm dia RCC pipe NP2 class (light duty)

Item specifications for Supply of ISI mark 300mm dia RCC pipe NP2 class (light duty)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of ISI mark 300mm dia RCC pipe NP2 class (light duty) for fixing in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc. as required.		-		

93. Laying and fixing ISI mark 300mm dia RCC pipe NP2 class (light duty)

Item specifications for Laying and fixing ISI mark 300mm dia RCC pipe NP2 class (light duty

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Laying and fixing ISI mark 300mm dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc. as required.		-		

94. Supply of junction box , single front construction , Powder coated IP 54

Item specifications for Supply of junction box , single front construction , Powder coated IP 54

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of junction box , single front construction , Powder coated IP 54, non compartmental, SS304, 3 mm thick removable gland plate, for bottom entry, lug and ferrules at both side of control wiring, Aluminium name plate on front hinged door , 2 nos earth stud with 100 no of elmex type terminal blocks etc. Make: As per Dos Approved Panel List (attached).		-		

95. Installation , testing and Commissioning of junction box , single front construction , Powder coated IP 54

Item specifications for Installation , testing and Commissioning of junction box , single front construction , Powder coated IP 54

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation , testing and Commissioning of junction box , single front construction , Powder coated IP 54, non compartmental, SS304, 3 mm thick removable gland plate, for bottom entry, lug and ferrules at both side of control wiring, Aluminium name plate on front hinged door , 2 nos earth stud with 100 no of elmex type terminal blocks etc. Make: As per Dos Approved Panel List (attached).		-		

96. Supply of Local Push Button stations (LPBS)

Item specifications for Supply of Local Push Button stations (LPBS)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of Local Push Button stations (LPBS) details as per specification attached. Make: As per Dos Approved Panel List (attached).		-		

97. Installation testing and commissioning of Local Push Button stations (LPBS)

Item specifications for Installation testing and commissioning of Local Push Button stations (LPBS)

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply, installation testing and commissioning of Local Push Button stations (LPBS) details as per specification attached. Make: As per Dos Approved Panel List (attached).		-		

98. Supply of microprocessor based, 2-loop Analog addressable type fire alarm control panel (FACP)

Item specifications for Supply of microprocessor based, 2-loop Analog addressable type fire alarm control panel (FACP)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of microprocessor based, digital, distributed processing, real time, multi-tasking and multi-User type, 2-loop Analog addressable type fire alarm control panel (FACP) including supply of all fixing materials, interconnections, earthing complete as required detailed as per specification and equivalent to Model ZX2Se of Morley Make: Honeywell, Notifier, Morley IAS		-		

99. Installation, testing and commissioning of microprocessor based, 2-loop Analog addressable type fire alarm control panel (FACP) -

Item specifications for Installation, testing and commissioning of microprocessor based, 2-loop Analog addressable type fire alarm control panel (FACP) -

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation, programming, testing and commissioning of microprocessor based, digital, distributed processing, real time, multi-tasking and multi-User type, 2-loop Analog addressable type fire alarm control panel (FACP) including supply of all fixing materials, interconnections, earthing complete as required detailed as per specification and equivalent to Model ZX2Se of Morley Make: Honeywell, Notifier, Morley IAS		-		

100. Supply of Addressable multisensor type smoke detector

Item specifications for Supply of Addressable multisensor type smoke detector

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of Addressable multisensor type smoke detector having isolator in each individual unit along with base on ceiling / above false ceiling/soffit/Surface as required detailed as per specification and equivalent to Model No. 22051tE+MIB501APIV series of Morley Make: Honeywell, Notifier, Morley IAS		-		

101. Installation testing and commissioning of Addressable multisensor type smoke detector

Item specifications for Installation testing and commissioning of Addressable multisensor type smoke detector

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation testing and commissioning of Addressable multisensor type smoke detector having isolator in each individual unit along with base on ceiling / above false ceiling/soffit/Surface as required detailed as per specification and equivalent to Model No. 22051tE+MIB501APIV series of Morley Make: Honeywell, Notifier, Morley IAS		-		

102. Supply of UV IR Sensor for Methanol detection

Item specifications for Supply of UV IR Sensor for Methanol detection

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of UV IR Sensor for Methanol detection, range approx. 7.5 meter, response time typically 5 seconds, Operating Voltage - 24 V DC having alarm, fault and auxiliary output relay, 0-24mA current output, RS-485 Modbus compatible communication link that can be used in computer controlled installations etc. as required and details as per specification document. Note: Party to provide the 230V to 24V Power supply module along with half an hour Power Back up. Input Power supply (230V) for Power Supply module shall be provided by SCL. Make: Honeywell, Notifier, Morlay IAS, RKI, Drager, Spectrex or equivalent.		-		

103. Installation testing and commissioning of UV IR Sensor for Methanol detection

Item specifications for Installation testing and commissioning of UV IR Sensor for Methanol detection

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation testing and commissioning of UV IR Sensor for Methanol detection, range approx. 7.5 meter, response time typically 5 seconds, Operating Voltage - 24 V DC having alarm, fault and auxiliary output relay, 0-24mA current output, RS-485 Modbus compatible communication link that can be used in computer controlled installations etc. as required and details as per specification document. Note: Party to provide the 230V to 24V Power supply module along with half an hour Power Back up. Input Power supply (230V) for Power Supply module shall be provided by SCL. Make: Honeywell, Notifier, Morlay IAS, RKI, Drager, Spectrex or equivalent.		-		

104. Supply of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system

Item specifications for Supply of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system as required. Make: Honeywell, Notifier, Morlay IAS,RKI, Drager, Spectrex or equivalent.		-		

105. Installation testing and commissioning of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system

Item specifications for Installation testing and commissioning of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation testing and commissioning of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system as required. Make: Honeywell, Notifier, Morlay IAS,RKI, Drager, Spectrex or equivalent.		-		

106. Supply of addressable, Manual Call Point (MCP)

Item specifications for Supply of addressable, Manual Call Point (MCP)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of addressable, Manual Call Point (MCP) for installation on on the wall/Surface as required. Make: Honeywell, Notifier, Morley IAS		-		

107. Installation, testing and commissioning of addressable, Manual Call Point (MCP)

Item specifications for Installation, testing and commissioning of addressable, Manual Call Point (MCP)

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Installation, testing and commissioning of addressable, Manual Call Point (MCP) on the wall/Surface as required. Make: Honeywell, Notifier, Morley IAS		-		

108. Supply of addressable loop Sounder

Item specifications for Supply of addressable loop Sounder

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of addressable loop Sounder with base on wall just below the ceiling/ any other suitable surface as required, equivalent to model no-WSOPRN05 of Morley. Make: Honeywell, Notifier, Morley IAS		-		

109. Installation, testing and commissioning of addressable loop Sounder

Item specifications for Installation, testing and commissioning of addressable loop Sounder

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation, testing and commissioning of addressable loop Sounder with base on wall just below the ceiling/ any other suitable surface as required, equivalent to model no-WSOPRN05 of Morley. Make: Honeywell, Notifier, Morley IAS		-		

110. Supply 2Cx1.5mm2 Copper, extruded PVC inner sheath cable

Item specifications for Supply 2Cx1.5mm2 Copper, extruded PVC inner sheath cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I, bearing ISI certification.) on existing cable tray/wall as required. Make: Finolex/Havells/KEI/ RPG/ECKO/CCI		-		

111. Installation of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade

Item specifications for Installation of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I, bearing ISI certification.) on existing cable tray/wall as required. Make: Finolex/Havells/KEI/ RPG/ECKO/CCI		-		

112. Supply of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade

Item specifications for Supply of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I, bearing ISI certification.) for laying direct in ground including excavation and refilling the trench, cable route marker etc. as required, but excluding sand cushioning and protective covering. Make: Finolex/Havells/KEI/ RPG/CCI.		-		

113. Laying of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade cable

Item specifications for Laying of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Laying of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I, bearing ISI certification.) direct in ground including excavation and refilling the trench, cable route marker etc. as required, but excluding sand cushioning and protective covering. Make: Finolex/Havells/KEI/ RPG/CCI		-		

114. Supply of brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable

Item specifications for Supply of brass compression gland and copper lugs for 2Cx1.5mm2

Copper cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supplying brass compression gland and copper lugs for making end termination of 2Cx1.5mm2 Copper cable in existing MS Box of installed above the false ceiling/wall/surface as required. Make: Dowells, 3M, Hex, Comat.		-		

115. Making end termination with brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable

Item specifications for Making end termination with brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Making end termination with brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable in existing MS Box of installed above the false ceiling/wall/surface as required. Make: Dowells, 3M, Hex, Comat.		-		

116. Supply of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block for loop in loop out of 2C x1.5 sq. mm copper armoured cable

Item specifications for Supply of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block for loop in loop out of 2C x1.5 sq. mm copper armoured cable

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Supply of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block for loop in loop out of 2C x1.5 sq. mm copper armoured cable and connection to the fire detector device, at ceiling/wall/surface/recess including wall cutting and providing necessary hardware for mounting /fixing, including all material for fixing as required. Make: Reputed ISI make.		-		

117. Installation, testing and commissioning of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block

Item specifications for Installation, testing and commissioning of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Installation, testing and commissioning of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block for loop in loop out of 2C x1.5 sq. mm copper armoured cable and connection to the fire detector device, at ceiling/wall/surface/recess including wall cutting and providing necessary hardware for mounting /fixing, including all material for fixing as required. Make: Reputed ISI make.		-		

118. Supply of IP 65 or better, explosion proof/Flame proof loud speaker

Item specifications for Supply of IP 65 or better, explosion proof/Flame proof loud speaker

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make: Baliga, Stahl, Sudhir Switchgear.		-		

119. Installation of IP 65 or better, explosion proof/Flame proof loud speaker

Item specifications for Installation of IP 65 or better, explosion proof/Flame proof loud speaker

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make: Baliga, Stahl, Sudhir Switchgear.		-		

120. Supply of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH)

Item specifications for Supply of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Commscope, Schneider, Molex, Siemon		-		

121. Laying of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH)

Item specifications for Laying of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Commscope, Schneider, Molex, Siemon		-		

122. Supply of CAT6A Patch/Jack Panel of 24 Port unloaded in Network rack with port identification number, with self adhesive clear label holder.

Item specifications for Supply of CAT6A Patch/Jack Panel of 24 Port unloaded in Network rack with port identification number, with self adhesive clear label holder.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Each port/jack on the panel should be individually removable on field from the panel and have integrated rear cable management metallic shelf and have a separate provision of grounding. Make Commscope, Schneider, Molex, Siemon		-		

123. Installation testing and commissioning of CAT6A Patch/Jack Panel of 24 Port unloaded in Network rack

Item specifications for Installation testing and commissioning of CAT6A Patch/Jack Panel of 24 Port unloaded in Network rack

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	with port identification number, with self adhesive clear label holder. Each port/jack on the panel should be individually removable on field from the panel and have integrated rear cable management metallic shelf and have a separate provision of grounding. Make Commscope, Schneider, Molex, Siemon		-		

124. Supply of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs

Item specifications for Supply of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	, Aluminium/polyester shield screen material, with low smoke Zero halogen sheath, comply to TIA-568-C.2 Cat 6A in I/Os of Network Rack. Make Commscope, Schneider, Molex, Siemon		-		

125. Installation testing and commissioning of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire

Item specifications for Installation testing and commissioning of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	, factory pre terminated with shielded RJ45 plugs, Aluminium/polyester shield screen material, with low smoke Zero halogen sheath, comply to TIA-568-C.2 Cat 6A in I/Os of Network Rack. Make Commscope, Schneider, Molex, Siemon		-		

126. Supply of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs

Item specifications for Supply of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	, Aluminium/polyester shield screen material, with low smoke Zero halogen sheath, comply to TIA-568-C.2 Cat 6A in Aluminium Bus trunking at field side. Make Commscope, Schneider, Molex, Siemon		-		

127. Installation testing and commissioning of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire,

Item specifications for Installation testing and commissioning of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire,

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	factory pre terminated with shielded RJ45 plugs, Aluminium/polyester shield screen material, with low smoke Zero halogen sheath, comply to TIA-568-C.2 Cat 6A in Aluminium Bus trunking at field side. Make Commscope, Schneider, Molex, Siemon		-		

128. Supply of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category 6A or better,

Item specifications for Supply of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category 6A or better,

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TIA568C.2-500MHz in Aluminium Bus trunking/Raceway at field side. Make Commscope, Schneider, Molex, Siemon		-		

129. Installation of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category

6A or better,

Item specifications for Installation of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category 6A or better,

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	TIA568C.2-500MHz in Aluminium Bus trunking/Raceway at field side. Make Commscope, Schneider, Molex, Siemon		-		

130. Supply of square face plate (Dual) with a provision to support variety of jacks- UTP,STP etc.

Item specifications for Supply of square face plate (Dual) with a provision to support variety of jacks- UTP,STP etc.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	. in Aluminium Bus trunking system/Raceway on the field side Make Commscope, Schneider, Molex, Siemon		-		

131. Installation of square face plate (Dual) with a provision to support variety of jacks- UTP,STP etc.

Item specifications for Installation of square face plate (Dual) with a provision to support variety of jacks- UTP,STP etc.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	in Aluminium Bus trunking system/Raceway on the field side Make Commscope, Schneider, Molex, Siemon		-		

132. Supply of square face plate (single) with a provision to support variety of jacks- UTP,STP etc.

Item specifications for Supply of square face plate (single) with a provision to support variety of jacks- UTP,STP etc.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	in Aluminium Bus trunking system/Raceway on the field side Make Commscope, Schneider, Molex, Siemon		-		

133. Installation of square face plate (single) with a provision to support variety of jacks- UTP,STP etc.

Item specifications for Installation of square face plate (single) with a provision to support variety of jacks- UTP,STP etc.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	in Aluminium Bus trunking system/Raceway on the field side Make Commscope, Schneider, Molex, Siemon		-		

134. Supply of Network Switch in Network Rack with the following specification as below

Item specifications for Supply of Network Switch in Network Rack with the following specification as below

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Switch shall have: Port Density: minimum 8 10/100/1000 BaseT Ports & 4-1G SFP Ports ready for use with SFP module. Ports shall support PoE on all ports with PoE budget of 180W Architecture: stand alone rack mountable. Bandwidth: minimum 56Gbps of switching bandwidth to support above listed ports in non blocking configuration. Stackable/Scable: support for stacking multiple switches Stacking backplane bandwidth: Access switch shall have additional port(s) for providing minimum 40 Gbps stacking bandwidth L2 Features: 802.1x authentication, spanning tree etc. Network/jflow/sflow or equivalent: provision for Network/jflow/sflow or equivalent support Network Management: support Network Management through command line interface (CLI), SNMP v1, v2c, v3, https IPv6 Readiness: IPv6 Readiness from day 1. Regulatory/Safety: confirming to UL60950 & EN60950. EAL/NIAP certified: Model No shall be EAL or NIAP/NDPP certified. Make : Cisco, Juniper, HP, Brocade, dell		-		

135. Installation of Network Switch in Network Rack with the following specification as below

Item specifications for Installation of Network Switch in Network Rack with the following specification as below

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Switch shall have: Port Density: minimum 8 10/100/1000 BaseT Ports & 4-1G SFP Ports ready for use with SFP module. Ports shall support PoE on all ports with PoE budget of 180W Architecture: stand alone rack mountable. Bandwidth: minimum 56Gbps of switching bandwidth to support above listed ports in non blocking configuration. Stackable/Scable: support for stacking multiple switches Stacking backplane bandwidth: Access switch shall have additional port(s) for providing minimum 40 Gbps stacking bandwidth L2 Features: 802.1x authentication, spanning tree etc. Network/jflow/sflow or equivalent: provision for Network/jflow/sflow or equivalent support Network Management: support Network Management through command line interface (CLI), SNMP v1, v2c, v3, https IPv6 Readiness: IPv6 Readiness from day 1. Regulatory/Safety: confirming to UL60950 & EN60950. EAL/NIAP certified: Model No shall be EAL or NIAP/NDPP certified. Make : Cisco, Juniper, HP, Brocade, dell		-		

136. Supply of SMB Box for face plate (Dual/Single) as required.

Item specifications for Supply of SMB Box for face plate (Dual/Single) as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make Commscope, Schneider, Molex, Siemon		-		

137. Installation of SMB Box for face plate (Dual/Single) as required.

Item specifications for Installation of SMB Box for face plate (Dual/Single) as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Make -Commscope, Schneider, Molex, Siemon		-		

138. Supply of 25mm electrical grade, ISI mark, PVC Conduit

Item specifications for Supply of 25mm electrical grade, ISI mark, PVC Conduit

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	REPUTED MAKE		-		

139. Installation of 25mm electrical grade, ISI mark, PVC Conduit in wall/floor/slab/surface including wall/floor cutting and making good the same

Item specifications for Installation of 25mm electrical grade, ISI mark, PVC Conduit in wall/floor/slab/surface including wall/floor cutting and making good the same

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	as required.		-		

140. Supply of OFC SM OS2 Cable in existing 32mm HDPE pipe as required

Item specifications for Supply of OFC SM OS2 Cable in existing 32mm HDPE pipe as required

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	reputed make		-		

141. Installation of OFC SM OS2 Cable in existing 32mm HDPE pipe as required

Item specifications for Installation of OFC SM OS2 Cable in existing 32mm HDPE pipe as required

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	as required		-		

142. Supply 32mm HDPE pipe

Item specifications for Supply 32mm HDPE pipe

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

143. Laying of 32mm HDPE pipe direct in ground including excavation, sand cushioning, protective covering and refilling the trench

Item specifications for Laying of 32mm HDPE pipe direct in ground including excavation, sand cushioning, protective covering and refilling the trench

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	including standard cable route marker etc. as required.		-		

144. Supply of sliding LIU for OFC Termination with tray 1U as required.

Item specifications for Supply of sliding LIU for OFC Termination with tray 1U as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

145. Installation of sliding LIU for OFC Termination with tray 1U as required.

Item specifications for Installation of sliding LIU for OFC Termination with tray 1U as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

146. Supply of SC simplex single-mode LSZH pigtail, 1m as required.

Item specifications for Supply of SC simplex single-mode LSZH pigtail, 1m as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

147. Installation of SC simplex single-mode LSZH pigtail, 1m as required.

Item specifications for Installation of SC simplex single-mode LSZH pigtail, 1m as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

148. Supply of adaptor plate with 3 SC duplex SM adaptors as required.

Item specifications for Supply of adaptor plate with 3 SC duplex SM adaptors as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

149. Installation of adaptor plate with 3 SC duplex SM adaptors as required.

Item specifications for Installation of adaptor plate with 3 SC duplex SM adaptors as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

150. Trenching of Hard Soil

151. Trenching of Soft Soil

Item specifications for Trenching of Soft Soil

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	as required.		-		

152. Supply of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required

Item specifications for Supply of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	upplyof SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required. reputed make		-		

153. Installation of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required

Item specifications for Installation of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	installation of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required. reputed make		-		

154. Splicing of OFC as per Core as required.

Item specifications for Splicing of OFC as per Core as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	reputed make		-		

155. Supply of accessories for making the Chamber Pit- 1Mtr Depth with Lid for housing OFC

Item specifications for Supply of accessories for making the Chamber Pit- 1Mtr Depth with Lid for housing OFC

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	as required.		-		

156. Installation of accessories for making the Chamber Pit- 1Mtr Depth with Lid for housing OFC as required.

Item specifications for Installation of accessories for making the Chamber Pit- 1Mtr Depth with Lid for housing OFC as required.

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	reputed make		-		

Common Specifications (Applicable for all items)

Sl No	Specification	Value	Compliance	Offered Specification	Remark

1	Intent of the Project	a. The scope of Project includes Supply, Installation, Testing and Commissioning of electrical distribution system including illumination, MCC Panels, fire detection system, Paging etc. for the Chemical Store Building at Semi-Conductor Laboratory (SCL), Sector- 72, S.A.S. Nagar, Mohali (Punjab). b. Scope includes receiving, unloading, storage, insurance, in-plant transportation and all equipment & accessories covered under this specification. c. Technical Specification: Brief overview of Equipment & services under this specification is described here. i. General Specification. ii. Supply & Installation of Electrical MCC/PCC Panels, MCB DB, exhaust fan, light fixtures etc. iii. Supply & Installation of wire, cables, conduits, Modules, Switch/Sockets, termination, earthing etc. iv. Supply & Installation of Fire detection system and its accessories. v. Supply and installation of material for Earthing and lightning protection system vi. Any other electrical requirement for execution of the work. d. Drawing & notes All drawing & notes as listed in the annexure	Yes / No / Explain		

		form a part of this specification.			
2	General Information for Site Condition	The Contractor may visit the site of work at SCL to acquaint themselves of the actual site conditions.	Yes / No / Explain		
3	General Design Consideration	a. System configuration: i. Voltage Supply: 415V± 10% ii. Frequency : 50Hz± 5% iii. Fault level : As specified in the SLD iv. No of Phase and grounding: 3 Phase & Solidly ground earth v. Power Distribution: A.C., 3 Phase 4 wire for 3 Phase system, 1 Phase 3 wire system for 1 Phase system. b. Code & Standards: All electrical equipment and accessories to be furnished, installed and commissioned under scope of these specifications shall be designed, manufactured, tested and installed in accordance with relevant Indian Standard Specifications (ISS), Indian electricity rules and any other applicable regulations.	Yes / No / Explain		
4	Period of Completion	The time allowed for supply installation, testing and commissioning of the entire work shall be Five (5) months to be reckoned from the 7th day of issue of Purchase order by SCL.	Yes / No / Explain		

5	Drawing, Data and Manuals	Following drawings /documents shall be submitted by the selected contractor for approval of SCL for execution of the work. a. Foundation drawing of all floor mounted Electrical panels. b. General Layout (GA) drawing with dimension of all electrical equipment and Single line drawings (SLDs) of electrical Panel. c. Make, type and catalogue of Switchgears of Electrical MCC Panels, Power DBs, Power Cables and related accessories along with technical leaflets, data sheets, etc. to be provided by the contractor. The contractor shall abide by recommended makes mentioned in this document. d. Equipment data sheets furnishing guaranteed performance figure for each type of equipment. e. Test certificates, test results for each type of equipment. f. Check lists and tests to be conducted during erection, testing & commissioning of the individual equipment. On successful completion of the entire work, the Contractor shall provide 'As Built' drawings for all the Systems executed under the Contract. Three (03) sets of hard copies and one (01) set in soft copy (CD/DVD) in Auto-CAD and PDF format shall be provided to SCL for its record and reference. Contractor	Yes / No / Explain		

		shall also provide instruction / Operation manual(s) and maintenance manuals for the all equipment/ system installed under the project.			

6	Eligibility Criteria	Only those bidders meeting the below mentioned eligibility criteria are eligible to participate in the tender. 1. Should have satisfactorily executed at-least two (2) similar works of value not less than Rs. 50 Lakh each involving, inter alia, power distribution works consisting of MCCs/PCCs of rating not less than 400 A, 415 V, 35 kA (fault level) MCBDBs, lighting systems, cabling during the last 5 years. To ascertain eligibility for the work, the participating bidders shall enclose copy (ies) of the detailed Purchase Order(s) and their completion certificate(s), evidencing satisfactory completion of similar works issued by the respective clients/organisations. Completion certificate for works issued by private parties shall be supported by TDS. 2. Should not have incurred any loss in more than two years during the last five (5) financial years ending 31st March 2020. 3. The Contractor should possess valid license of Class ‘A’ Category Electrical Contractor issued by the State Licensing Authority. 4. The contractor shall carry out the work in co-ordination with the civil/mechanical works undertaken by other contractor engaged by SCL.	Yes / No / Explain		

7	Deviation	a. Contractor to clearly mention deviation(s), if any, from the specification in the unpriced techno-commercial bid. b. Unless such deviations are recorded in the deviation sheets and submitted with the bid, it will be assumed that the offer is made in conformity with the tendered specification in all respects. c. The deviations shall be evaluated by SCL and acceptance of the same shall be at the sole discretion of SCL.	Yes / No / Explain		
8	Quantity variation	The quantities indicated against each item in the Bill of Quantities (BOQ) are indicative and are for the purpose of bidding only. Variation in quantities upto + 25% shall be carried out by the contractor on the agreed/Purchase Order (PO) rates and terms & conditions as in the Purchase Order (PO). In case of contract items which exceed the said limit of +25%, the contractor may claim revision of rates supported by proof, analysis and if the rate claimed in excess of the rate specified in the bill of quantities, SCL's engineer–in-charge of the work shall, after giving consideration to the analysis of rates submitted by the contractor, determine the rates on the basis of market rates and the contractor shall be paid in accordance with the rates so determined. The Contractor's profit & OH shall be factored in the rate analysis @15%	Yes / No / Explain		

9	Extra Items	In case of extra items (that are completely new and are in addition to the items contained in the contract), the contractor may claim rates supported by proper analysis and SCL's engineer-in-charge of the work shall, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of market rates and the contractor shall be paid in accordance with the rates so determined. The Contractor's profit & OH shall be factored in the rate analysis@15%.	Yes / No / Explain		
10	Construction Power Supply	Electricity, if available in the premises, may be provided to the contractor by Department (SCL) only at a single point free of cost subject to the condition that Contractor has to make his own arrangement to tap Electricity from a 3 phase/single phase supply from the location decided by the SCL's Engineer-in-charge (E-I-C).	Yes / No / Explain		
11	Storage space, site office	Contractor will be provided a lockable room within SCL premises for storage space subject to availability. Contractor will make, at his own cost, temporary site office close to work site as per the location decided by the E-I-C.	Yes / No / Explain		

12	Safety	In the course of the work, personnel working in the system at site shall take utmost care for their safety and work purely at individual's/ vendor's risk. SCL shall not be responsible for any untoward accidents for the vendor's working personnel.	Yes / No / Explain		
13	Acceptance	Final acceptance would be done at SCL upon commissioning and demonstration of the functioning of the installations under the scope of this tender for a period of 10 days. In case of any deficiency, the same will be rectified by the party to the satisfaction of SCL without any additional cost.	Yes / No / Explain		
14	Material/system submittals	Materials/systems etc. procured by the selected Contractor for incorporation in the work will be only of Makes/Manufacturers specified in the tender document. Submittals of the same shall be submitted by the contractor for SCL review and approval.	Yes / No / Explain		

15	Internal Wiring	1. The electrical wiring installations and other accessories shall comply with latest IS code: 732 (part-II) 1983 and National Electric Code-1985. 2. The word concealed means it involves cutting of floor /wall and making good after laying the conduit/Metal raceway as per the enclosed drawings by the contractor as required. 3. The contractor shall provide all necessary components, fixing materials, accessories and interconnections as per standard practice. It is to be noted that ceiling rose forms a part of the specifications, hence not indicated separately and shall be provided by the contractor, as required. 4. Scope includes termination of wire, ferruling, dressing, cable tie etc. as required. 5. The work shall be executed as per the ISRO electrical specification available on ISRO site www.isro.gov.in in Schedule I to be read along with the tender specification.	Yes / No / Explain		

16	LED Luminaries	The scope includes supply, installation, testing, commissioning of flame proof/non-flameproof LED lighting fixture at the ceiling level (about 5.5 meter height) in the chemical store building, outer periphery of the store building; electrical room, AHU room at the first floor, as per drawings and discretion of E-I-C. Architectural plan of the building is attached. Supply of required accessories such as mounting brackets, nuts, bolts, screws, washers, glands and any other material required for installation of LED fixture as per specifications mentioned in BOQ, shall be part of the specification. Junction box, as required, for loop-in and loop-out of the cable for flame proof light fixture will be in the scope of the contractor. LED light fittings will be suitable for operation on 230V, single phase, AC supply. The fitting shall be supplied with all fixing material such as brackets, nuts, bolts etc. as required for installation of fittings. Special Conditions: a. Luminaire make (Brand) from among the recommended make mentioned in the tender document shall be clearly mentioned in Technical Bid along with complete technical details. b. The LED light fitting and its driver unit etc. shall have warranty for a period of 5 years from the date of installation and	Yes / No / Explain		

		commissioning. c. The flame proof fixture shall be provided along with the Petroleum and Explosives Safety Organization (PESO) certification.			
17	Flame Proof LED Fixtures	Supply and installation of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting as per IS 2206 with luminous efficiency 100Lm/watt or better, CRI > 0.8 & THD<10%, IP-66 as per IS/IEC 60529:2001, made of Die cast aluminium alloy, Heat resistant & tough clear dome glass, having enclosure: as per Ex-d, GAS Gr. IIA, IIB, IIC AS PER IS/IEC 60079-1:2007 & IS/IEC 60079-0:2004, Area of classification: ZONE-1, 2, 21 & 22 and temperature class T-6 or better as per IS/IEC 60079 complete with loop-in loop-out provision. Mounting bracket for mounting on the ceiling, Double compression cable gland shall be provided and install by the contractor along with the light fitting. Recommended Make of fixture: Baliga, Stahl, Sudhir Switchgear. Recommended make of LED: NICHIA / CREE / PHILIPS/ LUMILED / OSRAM	Yes / No / Explain		

18	General LED fixtures	Supply & fixing of wall/ceiling mounted batten type 20W LED tube light (Four feet) luminaire with efficient driver (efficiency shall be more than 90%) & with minimum lumens output of 2000 lumens per lamp, comprising of nano diffuser technology complete with efficient & constant current output driver suitable for operation on 230V, single phase, 50Hz AC supply, efficient heat sink, effective thermal management and with colour temperature shall be > 6000K. The LED with suitable control gear and power factor >0.9. LM 79 certification for luminaire/LM80 certificate for LED shall be submitted and with other standard accessories, prewired including necessary interconnections complete in all respects and as directed by EIC. (Similar to Philips Astra or equivalent) Recommended make of fixture: Philips, GE, Trilux, LT Recommended make of LED: NICHIA / CREE / PHILIPS/ LUMILED / OSRAM	Yes / No / Explain		

19	Street Light Fixture	Supply and installation of 72W/75W LED Street Light fixture with High-brightness White LEDs sources with high transmittance flat toughed glass cover and peanut LENS on each LEDs, System luminous efficacy 100 Lms/Watt, 5600K colour temperature & 70 CRI value for ensuring good quality light output. Life of at-least 50,000 hours at 70% lumen maintenance & LED driver efficiency > 85%, Power factor greater than 0.95, THD<10% & min 3KV surge protection with operating voltage range from 120-270V for ensuring lifelong high performance of luminaire, the fixture shall be made of LM-6 Pressure die-cast aluminium with engraved company name & have IK05 & IP66 Class protection with NABL Accredited LM-79 & LM-80 Report. Mounting: pole mounted upto a height of 8 meter and pole bracket diameter of 48-60 mm (adjustable). Recommended make of fixture: Trilux, Philips, GE, LT Recommended make of LED: NICHIA / CREE / PHILIPS/ LUMILED / OSRAM.	Yes / No / Explain		

20	Street Light Pole	Providing and installation of hot dipped galvanized swaged tubular 9-meter-long with planting depth 1.5 meters' street light poles. The effective length of each section shall be- bottom: 5 meters, middle 2 meters and top 2 meters. The outside dia and thickness of pole shall be minimum 114.30x4.40mm, 88.9x4.085mm, 76.1x3.25mm respectively as required. The pole shall be provided with necessary bracket (inclination 105/115 degree, length 1.5 meter, dia 45 mm) for mounting upto 72 W LED street light fixture. Each pole shall have a weather proof looping/terminal box clamped at 550 mm above ground level along with a suitable earth terminal. The looping box shall be provided with a suitable Power terminal arrangement to loop 4C x10sq.mm size cable and MCB/5A fuse cut-out. A base plate 300 x300x10mm shall be welded to the bottom of the pole. Both underground cable and GI earth wire shall be terminated at the terminal/ looping box in the looping zone. Further wiring to the light fixture shall be done with three core flexible copper wire (2core for power supply and third core for earthing). GI tubular pole shall be installed in cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone	Yes / No / Explain		

		aggregate 40 mm nominal size) foundation including excavation and refilling etc. Party to cast 2 run of 32 mm MS conduit for cables upto a height of 550mm from ground level for loop in loop out of cable. The civil work for street light pole foundation forms a part of installation of the work and will be done by the party as required for commissioning of lighting pole. For earthing of street light poles, coil/spiral earthing using 8 SWG GI wire shall be used. The GI wire shall be buried to a minimum depth of 1.5 m with excavation, refilling of earth and connecting GI wire to pole using GI bolt and nut complete as per requirement. Make of Pole: Reputed make with ISI mark Note: Party shall submit Drawing of the street light pole for SCL approval. The street light pole supplied shall be of SCL approved design.			

21	Cables, wire, conduit, earthing, Switchboards, Switches/Sockets etc	(i) Cables: The scope includes the Supply and installation of XLPE insulated, overall FRLS PVC outer sheathed, Al/Cu armored cable on wall/surface/soil/existing cable tray as required for MCC Panel and MCB DBs as per the detailed specification and quantity in this document. All necessary hardware for installation of cable like cable tie, clamps, tags etc. is in the scope of Contractor. Contractor to ensure that cable laid on the cable tray is properly clamped with GI clamps and cable is properly secured on cable tray. (ii) Wire: The scope includes the Supply and installation of FRLS Copper wire of different size quantity & Specification for power distribution and lighting and power etc. as per the requirement. (iii) Conduit: The scope includes the Supply and installation of ISI makes MS Conduits of different size as per Specification for power and lighting distribution, switch sockets etc. as per the requirement. Flexible conduit shall be of GI. (iv) Cable tray: The scope includes the supply and installation of GI/MS cable trays as per specifications. (v) Earthing: The scope includes the supply and providing earthing for Panels, DBs, cable trays, light fixtures and poles, flameproof	Yes / No / Explain		

		accessories, fire panel, speakers, exhaust fans etc. matching the specifications given in this tender document. (vi) Lightning protection: The scope includes the supply and providing earthing for lightning protection of the building as per the IS 2309; specification and quantities as per the BOQ. The scope includes horizontal and vertical runs, earth pits, test point, earthing of building periphery for contour etc. (vii) Rack earthing: The scope includes the supply and providing earthing for racks as per specifications. (viii) Switchboards and Switch/Sockets: The scope includes the Supply and installation of different size of flameproof/non-flameproof Switchboards and switch/socket for Lighting, Power Distribution as per specification. (ix) MS/GI Conduits, flexible GI conduit, earthing materials, double/single compression brass cable glands, cable lugs (Al & Cu as required), cable ties, cable/wire identification tags required for the installation and maintenance of trouble free operation of the downstream system and accessories are covered under this specification. (x) MS junction box, conduit along with all related accessories as per specification.			

22	Electrical Panel Specification: General	i) Panel shall be fabricated as per IEC 61439 part 1 & 2. ii) Panel shall be indoor, metal clad, air insulated floor mounted extendable to side, single front construction, front wired, front connected. iii) Minimum thickness of sheet metal used shall be 2 mm and panel shall confirm to IP54 protection. IP test certificate shall be furnished along with the offer. iv) The design should be fully compartmentalized with metal partitions between compartments. All doors shall be gasketed. Each vertical section shall have removable back cover. v) All switches, push buttons, lamps, indicating instruments shall be flush mounted. vi) A full height vertical cable chamber with cable supports shall be provided in each section to facilitate unit wiring. Cable chamber shall be sized to accommodate all cable and shall have removable covers. A horizontal wire way extending the entire length shall be provided at the top of panel for inter panel wiring. vii) The Panel shall be mounted on a robust base frame made up of steel channels with a minimum height of 75 mm. The base frame shall be able to withstand the static and dynamic loads of the LT Panels. The steel channels shall be painted with two coats	Yes / No / Explain		

		of black enamel paint over a coat of zinc chromate primer. The steel channels shall have slots/ holes provided for fixing the panel. viii) The panel shall undergo seven tank or better process as per relevant IS/IEC standards. ix) Lifting hook shall be provided at each section for easy transportation. x) Different compartment of the panel shall be provided with dust proof type air filter louvers /explosion vents or similar safety arrangements in the panels to let out gases under pressure generated during event of any fault inside the panel. xi) Panel shall have pocket for the Panel drawing in the incomer section. xii) The LT Panel shall be designed for usage up to an altitude of 2000 m as per IS/IEC 61439. xiii) The Panel shall, in all respects, be suitable for operations in service conditions and shall withstand the stresses due to the seismic conditions. xiv) The Panel along with Switchgears, Busbars and connections shall have all type tests a defined in latest IS/IEC 61439-1 & 2with latest amendments for the ratings specified from CPRI/ERDA/Independent international test house. All type test reports as per IS/IEC 61439 shall be submitted along with the offer for verification.			

		xv) Panel shall be tested to withstand internal arc fault and valid Type Test Certificates have to be provided as per IEC61641 (with latest amendments). xvi) The LT panel enclosure shall designed to take care of normal stress as well as abnormal electro-mechanical stress due to short circuit conditions. All covers and doors provided shall offer adequate safety to operating persons and provide minimum ingress protection of IP 54. Ventilating openings and vent outlets, if provided, shall be arranged such that same ingress protection of IP 54 is retained. xvii) Panel shall also have test certificate for seismic withstand capacity as per relevant standards. xviii) The LT panel shall be provided with front and back access and the maximum height of the panel shall not exceed 2300 mm. All operating devices on the LT panel shall be positioned at an accessible height. xix) The switchgear assembly/sub-assemblies or panels shall be termite and rodent proof. The sub-assemblies of similar equipment shall be interchangeable. xx) Electrical panel shall be installed in a room having dimension 5250mm (l) X 5000 mm (b) located at first floor of New Chemical store Building in SCL.			

23	Electrical Panel Specification: IEC /IS STANDARDS (with latest Amendment as applicable)	IEC 61439 (Part-1 & 2) Low-voltage Switchgear and Control gear assemblies IEC 60044 (Part-1 & 2) Instrument Transformers (Current Transformer & Potential Transformer) IS/IEC 60947 (Part-1 to 5) Low voltage switchgear and Control gear IEC 61641 : 2008 / IS: 2147:1962 Specification for Internal Arc Containment Test IS/ IEC 60529 Degree of protection provided by enclosures (IP code) IEC 60073 Basic and Safety Principles for Man-Machine Interface, Marking and Identification – Coding Principles for Indicators and Actuators. IEC 60417 Graphical symbols for use on equipment. IEC 62052-11 Electricity metering equipment (AC) General requirements, tests and test conditions Part 11: Metering equipment-First Edition. IEC 62052-21 Electricity metering equipment (A.C.) General requirements, tests and test conditions Part 21: Tariff and load control equipment-First Edition IEC 62208 Empty enclosures for low-voltage switchgear and Control gear assemblies General requirements IEC 60228 Conductors of Insulated Cables. IS 694 PVC insulated cables for voltage including 1100 V with	Yes / No / Explain		

		copper conductor. All other relevant IS/IEC standards shall also be applicable.			

24	Electrical Panel Specification: Busbar and Bus Taps	i) Construction of Busbar, Busbar connections, Busbar chamber, supports and conductors shall be as per the type tested/ verified design in compliance to IS/IEC 61439. Busbars shall be provided with colour coded sleeves for phases and Neutral identification. ii) The short-time withstand current rating shall be as specified in the SLD. iii) Busbars shall be of rectangular section with hard drawn high conductivity with minimum 99.0% purity, aluminium conductor adequately rated and supported by moulded insulators spaced at suitable intervals. The complete assembly shall be capable of withstanding the maximum mechanical stresses to which it may be subjected to under fault conditions. iv) The configuration of LT panel shall be such that its bus bar shall be extensible on both sides by addition of vertical sections after removal of the end covers. v) The cross section of neutral busbar shall be same as that of the phase busbars. vi) Auxiliary buses for control power supply, space heater power supply or any other specified service shall be provided. These buses shall be insulated, adequately supported and sized to suit specific requirement. vii) Barriers shall be provided between the busbar chamber cover and live busbar in order to avoid	Yes / No / Explain		

		accidental contact with live parts. viii) The main bus and connections shall be of high connectivity Aluminium/Aluminium alloy, sized for specified current ratings with maximum temperature limited to 85 C. i.e. 35 C rise above ambient temp. of 50 C. ix) Separate vertical bus bars shall be provided for each vertical panel. x) Adequate contact pressure shall be ensured at bus connections by means of two bolt connections with plain and spring washers and lock nuts. xi) Bus bar and connections shall be fully insulated for working voltages with adequate phase/ground clearances. Insulating sleeves heat shrink type for bus bar and shrouds, removable type joints shall be provided. Bus insulators shall be flame retardant. Busbar should be connected in such a way that it can be dismantled/assembled while separating different section of the panel. Shrouds of transparent sheet on the exposed bus in cable alleys, for adequate safety measure. Clearances between phases-phases, phase – Earth/ neutral should be in line with IS/IEC 61439. Bus Bar supporting Material shall be of SMC/DMC.			

25	Electrical Panel Specification: Surge Protection Devices (SPDs)	i) Panel incomers shall be protected by providing a suitable Surge Protection Device (SPD) having voltage protection level 1.5 kV. At the line entrance into the structure (at the boundary of Lightning Protection Zone-1, for example at the main LT panel), SPD tested with typical 10/350 impulse current waveform and tested with 8/20impulse current waveform i.e. SPD Class1 & 2 shall be provided. Sub-distribution panels (at the boundary of Lightning Protection Zone-2 and higher)shall be protected with SPD tested with typical 8/20 impulse current waveform i.e. SPD Class 2. f. ii) SPD shall be installed in LT panel in such a way that the maximum length of wire/ cable connecting SPD and Earth Bus shall be lesser than 0.50m.	Yes / No / Explain		

26	Electrical Panel Specification: Control Module	Fixed type control module shall house the control components for a circuit. The equipment layout shall provide sufficient working space in between the components and subject to SCL approval. Each control module shall be equipped with AC/DC potential free Relays (230V AC/24V DC), Contactors etc. for seamless interface of the operation of Drives from FCMS (PLC). Vendor to provide the potential free contact to facilitate operation from MCC, LPBS and remote operation from FCMS/PLC. Vendor shall provide with each drive module auto/manual selector switch and each drive module shall be wired up to the terminal block for local/remote selection, ON, OFF, trip, feedback to SCL's control station and ON/OFF command room FCMS/PLC as well. MCC panel and LPBS shall have selector switches for MCC/Local(LPBS) and Local/Remote selection respectively. Control (On/Off) of the Drives/heaters will be as per specification document uploaded separately.	Yes / No / Explain		

27	Electrical Panel Specification: Thyristor based Heater Control	i) DYDAC Make Thyristor power controller Type: 3003 or equivalent, rating 85kW, Control input 4-20mA, Thyristor input supply- 415V AC (3-) and output supply- controllable 415V AC (3-), which shall be provided by the vendor in a separate compartment of the MCC. 4-20mA Control signal from the heater PID will modulate the thyristor controller output to maintain the fresh air temperature at set value. Heater ON and OFF set points shall be adjustable in the SCADA in FCMS. ii) Thyristor controller run command, run feedback, 4-20mA modulating signal shall be wired up to the terminal block in the cable alley in the MCC. Thyristor Panel/compartment shall be complete with inter module control and power wiring. 220V AC supply shall be drawn from one of the phase and neutral of the incoming 415VAC and connect to the Thyristor supply terminals through MCB. Circuit breaker ‘switch ON’ and Thyristor control unit ‘RUN command’ will get activated from FCMS if air temperature is below ON set point. Circuit breaker ‘switch OFF’ and Thyristor control unit ‘RUN command withdraws, will get activated from FCMS when temperature becomes above OFF set point.	Yes / No / Explain		

28	Electrical Panel Specification: MCCB	i) The MCCBs should be extra current limiting type with trip time of less than 10 m sec under short circuit conditions. The current limiting action should be achieved with repulsion principle. The MCCBs should preferably have an anti-reclosing feature. ii) The MCCBs should be 3 or 4 poles as per SLD. iii) The MCCBs shall be arranged in multi-tier formation. iv) The MCCBs should have a Service short circuit breaking capacity (Ics) of not less than 35 kA rms at 415 Volts 50Hz AC for incomer. The service breaking capacity should be equal to ultimate breaking capacities (Icu) (i.e. Ics= Icu=100%). v) The release should be thermal magnetic having adjustable overload and short circuit. vi) Switches shall be triple pole air break AC23 motor duty for motor starter feeders. vii) Cubicle doors of incoming and outgoing shall be mechanically interlocked with switchgear to prevent unintentional openings of the door while the unit is in energized condition. However, defeat interlock provision is also to be provided. viii) All incoming and outgoing feeders shall be provided with bolted disconnect link for isolation of neutral, if necessary. Selector switches shall be of rotary type. ix) The MCCB shall be provided with rotary drive kit, spreader	Yes / No / Explain		

		terminals and ON/OFF/Trip (MCCB) position of switch handle to be clearly marked. x) Duct Heater MCCB shall be motorized to control (ON/off) from FCMS. xi) For incomers it should be EDO, microprocessor based communicable MCCB (35 kA or above) with numerical releases for O/L, S/C & EFR. (With mechanical and Electrical interlocking for operation of only one ACB at any point of time.)			
29	Electrical Panel Specification: MPCB	i) The MPCBs should be of 3 pole, air break type AC3 Duty continuous rating as specified. ii) MPCBs should have at least 1NO+1NC contact. iii) These should have trip indication, test trip function. iv) The release should be thermal magnetic having adjustable overload trip setting. v) The service breaking capacity should be equal to ultimate breaking capacities (Icu) (i.e. Ics= Icu=100%). vi) The MPCBs should be suitable for din rail type mounting.	Yes / No / Explain		
30	Electrical Panel Specification: Capacitor Bank	Supply and installation of Capacitor Bank - Box Type, Dry construction, Conforming to IS 13340-41/IEC 60831, 440V, 50Hz, Rated Current (In) as per Load, Heavy Duty, Dielectric MPP, Low loss type with overall loss < 0.5W/kVAR, Delta Connection with Discharge Device.	Yes / No / Explain		

31	Electrical Panel Specification: Contactor	i) The contactor shall be 3 pole, air break type AC3 Duty continuous rating for motor starter feeders with non-bouncing silver/ silver alloy contacts. ii) Contactor shall be of electromagnetic type rated for uninterrupted duty as per relevant standards and also suitable for capacitor duty iii) Contactor shall be provided with adequate auxiliary contacts rated for 10Amps @ 240VAC for interfacing with control scheme. iv) Contactor coil rating shall be minimum pick up of 85% of rated voltage and minimum drop out of 75% rated voltage.	Yes / No / Explain		
32	Electrical Panel Specification: Control and Indications	i) Push buttons will be heavy duty, oil tight, and push to actuate type with integral plate marked with its function. ii) Each push button shall be provided with 2NO+2NC contacts rated for 10Amps @ 240VAC. iii) Lamps shall be LED type rated for 240V AC. Lens and lamps shall be replaceable from the front. iv) The control supply shall be through a 415V/230V transformer and the vendor shall provide 1 no. 415V/230V transformer for the same. Vendor shall also provide Power module for 24V DC Supply for the operation of heaters control module.	Yes / No / Explain		

33	Electrical Panel Specification: Meters	i) All indicating instruments shall be digital, Switchboard type with accuracy class +/- 2% full scale. ii) MFM of suitable rating shall be used in the incomer feeder. iii) Selector switches shall be furnished at outgoing feeders as per SLD for ammeter. iv) All meters shall be of digital type flush mounted industrial pattern of size 96x96 mm with accuracy class 0.5. v) Multifunction meter shall be of digital type flush mounted industrial pattern of size 96x96 mm with accuracy class 0.5 as per IEC 62052/53 suitable for measurement of Current, Voltage, Power, Frequency, Power factor, Energy and ready port to communicate with FCMS through RS 485. The Meter should have Modbus communication port as well.	Yes / No / Explain		

34	Electrical Panel Specification: CT (Current transformer)	i) CT will be cast resin type rated 15VA or more burden with Maximum accuracy limit of class 0.5. ii) The current transformers for metering and for protection shall be mounted on the busbars with proper supports. iii) Current transformers ratings shall be as indicated in BOQ. iv) Current transformers shall conform to latest edition to relevant standards. The Current transformers shall be epoxy resin cast with bar Primary or ring type. v) The design and construction shall be sufficiently robust to withstand thermal and dynamic stresses due to the maximum short circuit current of the circuit. CT core laminations shall be of high grade silicon steel. vi) Secondary terminals of CT shall be brought out suitably to a terminal block which will be easily accessible for testing and terminal connections. vii) Access to the CTs for cleaning, testing or changing shall be from front, back or top of the panel. viii) Name plate details and terminal markings shall be according to the latest edition of relevant Indian Standard.	Yes / No / Explain		

35	Electrical Panel Specification: Secondary wiring	i) All control wiring for panel shall be with FRLS copper conductor wires. The wiring shall be coded and labeled with approved ferrules for identification. The minimum size of copper conductor control wires shall be 1.5 sq. mm. All CT connections/ circuits shall be provided with copper conductor control wires with a minimum size of 2.5 sq. mm. Runs of wires shall be neatly bunched and suitably supported and clamped. Identification ferrules shall be used at both end of wires. ii) Panel shall be fully wired at the factory to ensure proper functioning of control and protection. iii) Fuse and links shall be provided to permit individual circuit protection from bus wires without disturbing other circuits. All spare contacts of relays, push buttons and other devices shall be wired up to terminal blocks. iv) Wire termination shall be done with crimping type connector with insulating sleeve.	Yes / No / Explain		

36	Electrical Panel Specification: Power/control Terminal Blocks	i) Terminal block shall be 660V grade box clamp type with marking strips similar to ELMEX 10 mm2 or equal for Control. ii) Terminal for CT secondary leads shall have provision for shorting. iii) Not more than two wires shall be connected to any terminal. iv) Spare terminals equal in number to 20% active terminals shall be provided. v) Terminal blocks shall be suitably located in cable alleys. vi) For Power cable, Bus Bar type cable connector (Melamine material) shall be provided. vii) For Control cable, heavy duty screw type cable connector (Melamine material) shall be provided.	Yes / No / Explain		
37	Electrical Panel Specification: Cable termination	i) Panel shall be designed for cable entry from top. ii) Each cable shall be clearly marked at both ends with an indestructible marker, preferably a cable tag made of Aluminium tacked with indicating cable number & both end feeder tags with switchboard tags. Cable tags at ends of cable shall be provided inside the gland plate as well as outside the gland plate iii) All provisions and accessories shall be furnished for termination of cables including removable gland plates, cable supports and terminal blocks. iv) Gland plate shall be minimum 3 mm thick.	Yes / No / Explain		

38	Electrical Panel Specification: Heating & Ventilation of Panel	i) Anti-condensation space heaters shall be fitted in cubicles together with an ON/OFF isolating switch suitable for electrical operation at 230 volts 50 Hz AC supply. The space heater shall be of sufficient capacity to raise the internal temperature of LT panel by 50 C over the outside ambient temperature. The design shall be such that the maximum permitted rise in temperature inside panel is not exceeded if the heaters are energized while the LT panel is in operation. Heaters shall be provided with protection against overheating such as thermostats, sensors etc. and associated disconnecting circuits. ii) LT Panel cubicles shall be properly ventilated with grills, louvers, fans etc. as per the design verified by IS/IEC 61439 while maintaining the IP.	Yes / No / Explain		
39	Electrical Panel Specification: Ground Bus	Continuous earth bus suitably (as per IS/IEC 61439) for prospective fault current to be provided with arrangement for connecting to station earth at two points. Hinged doors / frames to be connected to earth through adequately sized flexible braids.	Yes / No / Explain		

40	Electrical Panel Specification: Nameplate and Labels	i) Suitable engraved metal name plates and identification labels shall be provided for all LT panels and Circuits. These shall indicate the feeder number, feeder designation, rating of switchgear. Nameplate shall carry the name of the LT panel manufacturer and / or Original Manufacturer. ii) LT panel shall be provided with “Danger Notice Plate” conforming to relevant Indian Standards, preferably on busbar chamber cover. iii) Permanent marking of SLD shall be provided on the LT panel. iv) Drawing Pouch shall be provided at the incomer cable allay.	Yes / No / Explain		
41	Electrical Panel Specification: Painting	i) Panel shall be painted with light grey epoxy powder painted (Siemens Gray RAL 7032) and shall have matt finish. ii) The minimum powder coating thickness of of LT panel shall be 60 microns as per IS 13871. iii) Caution notice plate shall be fixed at the back of each vertical/horizontal bus bar allay of the panel.	Yes / No / Explain		

42	Electrical Panel Specification: Test Reports	a) Following complete set of type test reports/ design verification reports as per IS/IEC 61439 for the offered panel shall be submitted along with the offer and along with the GA drawings submitted for Department clearance. i. Strength of material and parts: Resistance to corrosion Properties of insulating materials Thermal stability Resistance to abnormal heat and fire due to internal electric effects Resistance to ultra-violet (UV) radiation (Applicable to outdoor installations) Lifting Mechanical impact Marking ii. Degree of protection of enclosures iii. Clearances iv. Creepage Distances v. Protection against electric shock and integrity of protective circuit Effective continuity between the exposed conductive parts of the assembly and the protective circuit Short-circuit withstand strength of the protective circuit. vi. Dielectric properties: Power-frequency withstand voltage. Impulse-withstand voltage. vii. Temperature-rise limits viii. Short-circuit withstand strength ix. Mechanical operation The relevant drawings of type tested/ design verified panels shall be	Yes / No / Explain		

		submitted to the department along with GA drawing of offered panel for verification. b) Type test reports as per IS/IEC 60947 for all type of switchgears proposed for the LT panel, shall be furnished to the department. c) Following routine tests shall be carried out as per IS/IEC standards at the LT panel fabricators shop in the presence of Department representative prior to despatch. Physical verification and dimensional check Verification of bill of materials, SLD, control circuits etc. Functionality check HV test Insulation resistance test d) Following pre-commissioning tests shall be carried out at site on LT panels: Physical verification and dimensional check. Verification of bill of materials, SLD, control circuits etc. Check cleanliness of cubicles, busbar chamber and interconnections and Check the tightness of busbar interconnections. Functionality check. Earth continuity test. Insulation resistance test.			

43	Electrical Panel Specification: Drawing & Information	a. The Vendor shall furnish following drawings/documents in accordance with enclosed requirements: General Arrangement drawing of the LT Panel, showing front view, plan, foundation plan, floor cut-outs/trenches for external cables and elevations, transport sections and weights. Sectional drawings of the circuit breaker panels, showing general constructional features, mounting details of various devices, bus bars, current transformers, cable boxes, terminal boxes for control cables etc. Schematic and control wiring diagram for circuit breaker and protection including indicating devices, metering instruments, alarms, space heaters etc. Terminal plans showing terminal numbers, ferrules markings, device terminal numbers and function details etc. Wiring diagrams. Equipment List. b. Vendor shall furnish required number of copies of above drawings for Department review. Fabrication of switch boards shall start only after clearance from Department. After final review, required number of copies (reproducible) shall be furnished as final certified drawings. The information furnished shall include the following: Technical literature giving complete information of the	Yes / No / Explain		

		equipment. Erection, Operation and Maintenance Manual complete with all relevant information, drawings and literature for auxiliary equipment and accessories, characteristics curves for relays etc. A comprehensive spare parts catalogue.			

44	Electrical Panel Specification: Installation and Commissioning	a. LT panels shall be supplied in properly packed conditions. After ascertaining that there is no damage to packing, all the items shall be inspected after unpacking. It shall be ensured that all LT panel components are in accordance with the requirements as described in the BOQ and drawings. It shall also be ensured that all the components like switchgears, relays, indicating lamps, meters etc. are in good condition and has not suffered any damage during transit. b. Any damaged components received at site shall be replaced at no extra cost by the supplier. Any damage over the finished sections including scratches on the paint etc. shall be attended and suitably finished by the supplier. c. LT panels shall be installed using necessary bolts for grouting of panels and shall furnish the drawing / templates if any required for grouting the foundation bolts. d. All loading and unloading arrangements and transporting of panels to site with necessary tools and equipments shall be the part of the scope of work and all required man power shall also be provided by the supplier for unloading and installation and commissioning the panels in the designated location at site.	Yes / No / Explain		

45	Make of Electrical panel	As per DOS Approved Panel manufacturer list (attached).	Yes / No / Explain		
46	Make of Switchgears	i) MCCB: Siemens/Schneider ii) Push button: Siemens/Schneider/ Teknic iii) Selector Switch: Siemens/Schneider/ Teknic iv) Fuse: Schneider/Siemens v) Timer: Siemens/Schneider vi) Control Transformer: AE/IMP/Indcoil vii) Terminal Block: Elmex/Connectwell/FTC viii) Meters: Conzerv/ L&T/ AE ix) CTs & PTs: Kappa/Automatic Electric(AE)/Nippen x) Contactors Schneider/Siemens xi) Indications Siemens/Schneider/ Teknic xii) Relays: Schneider/Siemens/PLA xiii) MCB: Schneider/Siemens xiv) Cooling Fan Rexnord/Sunon xv) Thyristor module DYDAC xvi) RCBO Siemens/Schneider xvii) MCB DB: Siemens/ABB/Legrand xviii) Line reactor/choke Allen Bradley xix) Capacitor Bank Neptune, Schneider, Siemens	Yes / No / Explain		

47	D. Local Push Button Station (LPBS)	The Scope includes supply and installation of LPBS for Chiller Pumps, AHUs, Heaters as per the BOQ and detailed specification given below: i) LPBS shall be indoor, metal clad, air insulated wall/Angle frame mounted as required, single front construction, front wired, front connected, hinged lockable door. LPBS for Chiller Pumps system shall be suitable for outdoor installation. ii) Minimum thickness of sheet metal used shall be 2 mm and panel shall conform to IP54 protection for indoor installation and IP65 for outdoor type LPBS. iii) All switches, push buttons with indicating LED lamps, indicating instruments shall be flush mounted. iv) The LPBS shall be used for remote operation of drives, Equipment and Heaters. v) To facilitate the local/remote operation, LPBS shall have Local/Remote selector switch and provided with Start push button, lockable Stop push button, ammeter of suitable range, Terminal Block and lockable Emergency off Switch etc. vi)LPBS shall be equipped with AC (230V)/DC (24V) Relays, Contactors etc. for seamless interface of the operation of Drives from FCMS (PLC). vii) LPBS should be suitable for wall mounting and provided with necessary	Yes / No / Explain		

		mounting arrangement. viii) Wiring shall be done with flexible 2.5sqmm copper 650V grade, PVC insulated switchboard wires. Each wire shall be identified at both ends with permanent markers bearing wire numbers as per wiring diagram. ix) Wire termination shall be done with crimping type connector with insulating sleeve. x) Gland plate shall be minimum 3 mm thick. xi) The nameplate of approved design shall be provided for each compartment and also at the top of each panel. Nameplate shall be minimum 20x70mm and 3mm thick. xii) LPBS shall be painted with light grey epoxy painted (Siemens Gray RAL 7032).			

48	Sub-Main Distribution Boards (SMDB): General Specifications	i) The SMDB entire system (busbar, enclosure along with switchgear) shall be complying with IEC 61439-1&2. ii) The short time withstand current of the SMDB shall be minimum 36 kA for 1 s. iii) SMDB shall have Impulse withstand voltage of 8 kV. iv) The bus bars should be of ETP grade tinned plated Copper. v) Busbar system of SMDB should be fully enclosed and totally insulated in housing made up of sheet moulding compound (SMC). vi) SMDB shall have R, Y , B, ON , OFF, Trip LED Indication along with Ammeter and Voltmeter for incomer. vii) Connections between busbar and incoming MCCBs shall be with rigid links. viii) A separate earth bar and neural bar shall be provided on both sides for ease of termination. ix) Adequate cable support and bending space need to be provided. x) SMDB shall have provision for adding metering unit on top and cable allay on bottom as well as sides. xi) For incoming cable SMDB shall have bottom Cable alley and for outgoings SMDB shall have side cable allay. Metering extension Box shall be provided to accommodate the meters and indication. To maintain the symmetry Corner Box	Yes / No / Explain		

		shall be provided. xii) Ingress protection (IP) rating of the SMDB shall be min. IP 43.			
49	Sub-Main Distribution Boards (SMDB): Construction	i) SMDB shall be fabricated from 16 SWG CRCA sheet metal & it should be wall mounting type suitable for indoor installations. ii) Internal separation of SMDB shall be of form 2B. iii) Front access shall be available to all components which require operations, maintenance or replacement. iv) SMDB shall have double door construction for better IP requirement and operator's safety. v) SMDB outer door opening shall be only by special tool / key to prevent unauthorized access. vi) After opening the door, SMDB shall have IP20 protection to avoid accidental touch by human. vii) After opening the door, SMDB shall have shield which allows MCCBs to be switched ON/OFF through its protruded knobs. viii) Removable gland plates shall be fitted for Top/bottom/side cable entry.	Yes / No / Explain		

50	Fire Detection System	Scope for fire detection system includes supply, installation, testing, commissioning of Fire panel, Addressable Fire detection devices, Manual Call Points, Addressable loop sounders, Switch Monitoring unit (SMU), UV IR sensor for detection of methanol flame, Cable, MS junction boxes for loop in loop out of cable as per specifications, and integrating the same with existing repeater panel as per the requirement.	Yes / No / Explain		

51	Fire Detection System: Multi-sensor Detectors	The smoke detectors shall be multi-sensor (heat and smoke) detector with isolator suitable for detecting a wide range of smoke from slow smoldering and fast flaming fire. The detector shall have following features i) Solid state addressing arrangement in combination with a hand held programmer to configure the sensor address. ii) Electronics free mounting base. iii) Twin alarm LEDs for 360 Degree viewing and shall have blinking LED facility. iv) The sensor shall have s removable chamber for ease of cleaning or replacement. v) Automatic compensation for smoke sensor contamination. vi) Shall have a built in test facility which allows the fire alarm control panel to adjust the alarm threshold levels to compensate for contamination and shall have a maintenance alarm display when threshold can no longer be adjusted. vii) Operating temperature - 10 Deg.C to 50 Deg.C and operating RH at 40 Deg.C-95% RH.	Yes / No / Explain		

52	Fire Detection System: Manual call stations	Manual Call Stations should have in built monitor module and press/break and resettable capability constructed of high impact LEXAN sheet with clearly visible operating instructions on the cover and the word "FIRE" shall appear on front and suitable for surface mounting/flush mounting complete as required.	Yes / No / Explain		

53	Fire Detection System: UV IR Sensor	The UV-IR flame detector shall operate on 24 VDC, 4-20mA current output, suitable for detection of Methanol flame with automatic built in test for reliable operations and suitable for installation in Hazardous area zone 1and 2 with Class I, Division 1,2, Gas group A B C. The detector shall not be susceptible to environmental conditions to generate false alarms. The entire system shall be rated for IP 66 or better and supplied with suitable mounting bracket. The system shall comply to the detailed specifications as listed below: i) Detection Technology: UV - IR Electro-optical detection. ii) Detection range: 7.5 meter iii) Field of View: greater than equal to 90° Both Horizontal and vertical. iv) Response Time: less than equal to 5 seconds v) Built in Test : Automatic vi) Operating Temperature Range : 0 to + 75°C vii) Operating Humidity Range: Continuous, 95% non-condensing viii) Analog Output signal : 4-20mA ix) Alarms & Fault : Normal: 4 mA , Fault : 02 mA, Alarm : 20 mA + 10% verified x) Operating voltage : 24 VDC (18-32VDC) xi) Power consumption: Vendor to specify for Standby and Alarm condition. xii) Sensor Calibration	Yes / No / Explain		

		/ Verification: Sensor calibration as per OEM for certified performance. xiii) Sensor Life: 2 Years (minimum) xiv) Sensor Calibration: vendor to carry out sensor calibration at site and submit calibration certificate valid for one year. xv) RFI/ EMI Susceptibility: xvi) Required EN 616326-3 and EN 6100006-3 or equivalent IP protection. xvii) IP protection : IP 66 or better xviii) Fault Diagnostic: Sensor Fault (end of life), other information. xix) Self-Check/ Test : Automatic during start-up xx) Housing : SS 316/ Epoxy Painted Aluminium die cast xxi) Start-up Time: Vendor to specify xxii) Approval/certification: PESO and ATEX - Ex d IIC C / Class 1, Div. 1,2 Group A, B, C, D Note: Vendor shall arrange the 230V AC to 24V DC Power supply module along with half an hour Battery Back up in MS powder coated Enclosure. Input Power supply (230V AC) for Power Supply module shall be provided by SCL.			
54	Fire Detection System: SMU Unit for UV IR sensor	Supply installation testing and commissioning of Switch Monitoring Unit (SMU) to configure the UV IR sensors with fire detection system as required.	Yes / No / Explain		

55	Fire Detection System: Sounders	Addressable Sounders shall be loop powered with all fixing materials complete as required. The sound level shall be 100dB (A).	Yes / No / Explain		

56	Fire Detection System: 6. Fire Alarm Control Panel (FACP)	FACP shall be of 2 loops. FACP shall be suitable for 230V, 50 Hz, AC supply and detectors shall be powered using FACP based detection circuits. Devices shall receive power and communication from the same pair of conductors. FACP shall provide for resetting detectors, fault isolation and sensor loop operation. FACP shall be suitable for mixing different fire devices and beam smoke detectors within the same loop to optimize field wiring. FACP shall have alarm indication of individual sensors, detector trouble alarm indication for dust accumulation. The panel shall check detector once in every 24 hours for contamination for this purpose. The FACP shall regularly supervise all the sensors and devices on the loop and initiate fire or trouble alarm whenever required. FACP shall have 2 wire circuits to connect minimum of 126 addressable devices per loop. FACP shall be with repeater interface and suitable 24V battery with built in software and 2 x 40 character alphanumeric LCD display and necessary front panel control keys, FACP shall display the date, time and description for Analog sensors to indicate alarms and trouble situations. a) FACP switches shall allow authorized	Yes / No / Explain		

		personnel to accomplish the following :- • Initiate a general alarm condition. • Silence the local audible. • Silence the alarm signals. • Reset all zones/points. b) FACP shall have walk test facility. c) Shall have facility for programming from the key board or utilizing PC set up software via laptop/desk top computer. d) Shall have memory data for panel configuration and operation reside in non-volatile memory (EPROM). e) FACP shall have facility for speech processor (to record pre-recorded message of 20 S) and also have Auto Dialer facility (can dial up to 8 different lines) f) All addressable units shall be connected to the FACP through the loop cards and shall be addressed though individualized numbers. The FACP shall be able to obtain analog value for all detectors in the circuit through a pulsed digitized current data. The FACP shall be able to analyze all analog inputs from all addressable units, and though its own software and ambient level screening the FACP shall be able to identify fire, possible fire or fault conditions. The unit supervision shall be dynamic and continuous. g) The FACP shall itself have all loop cards in it. No isolated			

		mother board or transponder shall be considered. h) Short/open circuit units shall also be reported at the FACP in such cases, the system through the use of fault isolators shall be able to isolate that segment between the two fault isolators. The missing Detectors/Devices shall also be reported to the FACP with identification of the location. i) The FACP shall have the facility to set smoke sensor sensitivity remotely to either high sensitivity manually or on a pre-programmed sequence (I.e. Day/Night) period. When an alarm condition is sensed at the FACP from a smoke or heat detector, a delay time/alarm verification period shall be started. If the sensor is still in alarm after the delay time expired, an alarm condition is reported. The delay time shall be adjustable from 0 to 990 seconds. j) The FACP shall have either an in-built or external printer coupled to the FACP, which shall log all events with time. The printout shall clearly indicate the event-Fire/Pre-Alarm/Fault etc. with the unit address and time. k) The FACP shall also be able to discriminate between false alarms and fire conditions, as well as priority selection of alarm in case alarm activities in two or more remotely located units simultaneously.			

		In such cases, the Manual Call stations shall have the highest priority. l) The FACP shall also be able to actuate switches automatically in case of Fire condition of AHUs and power supply or other system such as piped pressurized gas supply. m) The system shall be fail safe and adequate safe guards should be under taken that in the event of a failure of a part of the system it shall not handicap the complete system. The loop cards shall be of Modular construction. n) The FACP shall have its own battery backup of a minimum of 48 hours in normal run and then half an hour in alarm condition. The backup time calculation shall be done as per TAC standards. The Battery shall be 2 x 12V (24V) DC and of sealed maintenance free type, housed inside the FACP. o) It shall be able to withstand temperature variations from '0' Degree Centigrade to 55 Degree Centigrade. Further Relative Humidity (non-condensing type) up to 93% shall not hamper its performance. The voltage rating shall be from 17V DC to 31V DC, though the voltage may be change depending upon the working voltages of a proprietary FACP. Other details as per attached specification document.			

57	Fire Detection System: Repeater panel	Scope comprises of supply and installation of Repeater Panel which display fire / fault message simultaneously with the FACP. a. It shall be capable of interfacing with the FACP on a single RS 485 Bus. b. The panel shall be capable of operating on 24V DC supply. c. The independent 24V DC supply source to be installed in MS cubicle Box duly powder coated paint along with repeater panel. d. The panel shall have 2 x 40-character backlit display which shall display date, time and description of alarm / trouble events are that displayed in the panel shall be powered from the FACP. e. It shall have control keys for sound, silence, mute and to reset the FACP from the repeater stations. f. The repeater panel shall have LEDs indications for Supply, Fault, Mute, Silent, Disabled, Fire	Yes / No / Explain		
58	Fire Detection System: Fire Cable	Supply and installation of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armored and overall FRLS PVC outer sheathed 1.1 KV grade, as per IS 7098 (Part I, bearing ISI certification.) on existing cable tray/wall/soft soil/hard soil as required.	Yes / No / Explain		

59	Fire Detection System: Fire Cable termination	Supplying and making end termination with brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable in MS Box of Size 4"X4" installed above the false ceiling/wall/surface as required.	Yes / No / Explain		
60	Fire Detection System: Junction Box for Fire devices	Supply, installation, testing and commissioning of MS painted box, Size 4"X4" with ELMEX type terminal block for loop in loop out of 2c x1.5 sq mm copper armored cable and connection to the fire detector device on wall/surface/recess including wall cutting and providing necessary hardware for mounting /fixing, including all material for fixing as required.	Yes / No / Explain		

61	Paging	The scope includes supply, installation, testing and commissioning of Supply and installation of IP 65 or better, explosion proof/WP loud speaker, anticorrosive powder coated, red (RAL-3000), suitable for Zone I & II, Class II C, Hardware SS304, as per IS2148 and equivalent to model FLSR 25 of Baliga with necessary support, gland as required and installing the same on wall/surface with GI supports as required and connecting the same with wire. The Scope also includes supply and installation of 2Cx1.5mm2 FRLS armored and PVC sheath twisted pair wire, their termination, tagging, glanding, earthing etc. as required for speakers and other accessories requires for smooth commissioning of the paging system.	Yes / No / Explain		

62	Networks/LAN	The detailed specification for the network rack, switch, cable, cords, I/Os, face plates etc. and the required accessories shall be as below. CAT 6A or better cable shall be laid in the PVC Conduit. The detailed specifications for the different component of networks/LAN are as follows: i) Rack: Supply installation testing and commissioning of UL listed, modular type 12U network rack with front glass door and rear perforated door, floor mounted, Size: 550x550, with 1 No. of 5 port Octagonal PDU 5/15Amp with MCB and Fan Tray with minimum 2 Fans. The rack should have provision of 2 nos of cable manager duct type 1U and 2 vertical manager-concealed type. Rack should be three sides openable with front glass door and rear perforated door and provision of cable entry from top and bottom both with proper earthing kit as required. Recommended Make: Rittal, Netrack, Schneider, Valrack ii) Network Switch: Supply & installation of Network Switch in Network Rack with the following specification as below. Switch shall have: iii)Port Density: Minimum 8 10/100/1000 BaseT Ports & 4-1G SFP Ports ready for use with SFP module. Ports shall support PoE on all ports with PoE budget of 180W iv) Architecture: Stand-	Yes / No / Explain		

		alone rack mountable. v) Bandwidth: minimum 56Gbps of switching bandwidth to support above listed ports in non-blocking configuration. vi) Stackable/Scable: support for stacking multiple switches vii) Stacking backplane bandwidth: Access switch shall have additional port(s) for providing minimum 40 Gbps stacking bandwidth viii) L2 Features: 802.1x authentication, spanning tree etc. ix)Network/jflow/sflow or equivalent: provision for Network/jflow/sflow or equivalent support x) Network Management: support Network Management through command line interface (CLI), SNMP v1, v2c, v3, https xi) IPv6 Readiness: IPv6 Readiness from day 1. xii) Regulatory/Safety: confirming to UL60950 & EN60950. xiii) EAL/NIAP certified: Model No shall be EAL or NIAP/NDPP certified. Recommended Make : Cisco, Juniper, HP, Brocade, dell xiv) CAT 6A Cable: Supply and installation/laying of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH) with transmission properties & electrical properties tested minimum up to 500MHz & verified by ETL & comply with ANSI/TIA/EIA-568-C.2 & ISO/IEC 11801. Recommended make:			

		Commscope, Schneider, Molex, Siemon xv) Patch Panel: Supply installation testing and commissioning of CAT6A Patch/Jack Panel of 24 Port fully loaded in Network rack with port identification number, with self-adhesive clear label holder. Each port/jack on the panel should be individually removable on field from the panel and have integrated rear cable management metallic shelf and have a separate provision of grounding. Recommended make Commscope, Schneider, Molex, Siemon xvi) Patch Cords (1 meter): Supply installation testing and commissioning of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs, Aluminum/polyester shield screen material, with low smoke Zero halogen sheath, comply to TIA-568-C.2 Cat 6A in I/Os of Network Rack. Recommended make Commscope, Schneider, Molex, Siemon xv) Patch Cords (3 meter): Supply installation testing and commissioning of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs, Aluminum/polyester shield screen material,			

		with low smoke Zero halogen sheath, comply to TIA-568-C.2 Cat 6A at field side. Recommended make Commscope, Schneider, Molex, Siemon xvi) Information outlet: Supply and installation of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category 6A or better, TIA568C.2-500MHz at field side. Recommended make Commscope, Schneider, Molex, Siemon lxvii) Face Plate (Dual): Supply and installation of single gang square face plate (Dual) and SMB Box with a provision to support variety of jacks- UTP, STP etc. at the field side. Recommended make: Commscope, Schneider, Molex, Siemon. xviii) Face plate (single): Supply and installation of square face plate (single) with a provision to support variety of jacks- UTP, STP etc. at the field side. Recommended make: Commscope, Schneider, Molex, Siemon. xix) SMB Box: Supply and installation of SMB Box for face plate (Dual/Single) as required. Recommended make: Commscope, Schneider, Molex, Siemon. Other details as per attached specification document.			

63	Other Requirements	i) Erection testing & commissioning of items as per BOQ. ii) Special tools & tackles. Party shall arrange the ladder/scaffolding/stair for working at height for cable laying, Fire detection system, installation of light fixture. iii) Work shall be executed as per the ISRO contractor safety Manual. Contractor to ensure that the manpower is equipped with PPE for working at the site. iv) All relevant drawing, data, catalogues with instruction and trouble shoot manuals, type test certificates for the above accessories. v) Materials and accessories which are necessary or used for satisfactory and trouble free operation and maintenance of the above equipment's/material shall also be furnished. vi) Contractor shall deploy skilled & unskilled Labor, qualified technical Supervisor(s), erection tools & tackles, testing tools & equipment, supplies, consumables and hardware and transport for timely and efficient execution of the work. vii) Contractor shall guarantee LED fixtures (flameproof/non-flameproof) for a period of 5 years from the date of acceptance. The contractor's guarantee shall be supported with a guarantee from the manufacturer(s) in this regard.	Yes / No / Explain		

Supporting Documents required from Vendor

1. The Contractor should not have incurred any loss in more than two years during the last five (5) financial years ending 31st March 2021. Same has to be supported by financial statements.

2. The Contractor should possess valid license of Class 'A' Category Electrical Contractor issued by the State Licensing Authority. Same has to be enclosed.

3. The works should involve, inter alia, power distribution works consisting of MCCs/PCCs of rating not less than 400 A, 415 V, 35 kA (fault level) MCBDBs, lighting systems, cabling etc..

4. To ascertain eligibility for the work, participating bidders shall enclose copies of the detailed Purchase Order(s) and their completion certificate(s), evidencing satisfactory completion of similar works issued by the respective clients/organisations

5. Completion certificate for works issued by private parties shall be supported by TDS

6. The bidder should have satisfactorily executed at-least two (2) similar works of value not less than Rs. 50 Lakh each during the last 5 years.

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	This being two part Tender Technical and Commercial parts separate, the bidder should not attach any document(s) containing pricing information alongwith Technical Part. The tenders containing price information in Technical Part will be summarily rejected. Prices should be indicated in the Price Bid format only	Yes / No / Explain	
2	DELIVERY TERMS : For supply Store/s: Stores shall be despatched on F.O.R destination basis i.e. SCL, S.A.S. Nagar, Mohali, Punjab exclusive of GST as may be applicable	Yes / No / Explain	
3	GST: Purchaser is entitled to concessional GST of 5% as per Ministry of Finance Department of Revenue, Notification No. 47/2017 Integrated Tax (Rate) both dated 14th November 2017 respectively and would accordingly issue Exemption Certificate in favour of the contractor quoting in Indian Rupees. The bidder should take note of the same while quoting the prices in Indian Rupees. GST on installation/ services shall be applicable @18%.	Yes / No / Explain	
4	Period of Completion; The time allowed for supply installation, testing and commissioning of the entire work shall be Five (5) months to be reckoned from the 7th day of issue of Purchase order by SCL.	Yes / No / Explain	
5	VALIDITY: The tender must be valid for a minimum period of 120 days from the date of opening of Technical bid and 90 days after opening of Price bid.	Yes / No / Explain	

6	SECURITY DEPOSIT: On acceptance of the purchase order, the Contractor shall submit security deposit for three percent (03 percent) value of the Purchase Order (PO) within 15 days from the date of receipt of PO towards successful execution of the PO. Security Deposit shall be submitted through Demand Draft / Bankers Cheque/ Fixed Deposit Receipt or Bank Guarantee (BG) from any of the Scheduled Banks executed on non judicial stamp paper of appropriate value, and shall be valid for a period of sixty (60) days beyond the date for completion of the Purchase Order. This will be returned by SCL immediately on execution of the PO satisfactorily as per order terms. If not, the amount will be forfeited. Note: In case of BG, Vendor to ensure that their Banker gives Bank Guarantee(BG) confirmation over email from Bank Domain immediately after issuance of the same at the following email Ids njain@scl.gov.in CC: harjeet@scl.gov.in jarnail@scl.gov.in In addition the banker may send a scanned copy of the BG as an attachment.	Yes / No / Explain	
7	Warranty : The Contractor shall provide warranty of complete project for parts as well as labour for a period of 24 months from the date of final acceptance at Purchasers site at no extra charges against any manufacturing defect/faulty workmanship. In case any defect arises during warranty period, the Contractor should replace/rectify the same at its own cost at site/works.	Yes / No / Explain	
8	WARRANTY REPLACEMENTS: The replacement parts, if any, shall be supplied by the Contractor free of cost on F.O.R. Purchaser site at SAS Nagar, Punjab basis.	Yes / No / Explain	

9	TERMS OF PAYMENT: 90% value of the supply parts shall be paid within 30 days of receipt of material at Purchaser site and the balance 10% amount and 100% of installation charges shall be payable on acceptance of the entire project against a Performance Bank Guarantee. Payment towards services (installations etc.) shall be released after deduction of TDS, if any.	Yes / No / Explain	
10	PERFORMANCE BANK GUARANTEE (PBG): The Contractor shall furnish a Bank Guarantee (as per format given by purchaser) from any nationalized/ scheduled bank for an amount equivalent to 3% of the value of the Contract and shall be valid for a period of 60 days beyond the expiry date of warranty period. On the performance and completion of the Contract in all respects, the Bank Guarantee will be returned to the Contractor without any interest. Note: Vendor to ensure that their Banker gives Bank Guarantee(BG) confirmation over email from Bank Domain immediately after issuance of the same at the following email Ids: njain@scl.gov.in CC: harjeet@scl.gov.in jarnail@scl.gov.in In addition the banker may send a scanned copy of the BG as an attachment.	Yes / No / Explain	

11	DELAY IN COMPLETION/LIQUIDATED DAMAGES: If the Contractor fails to deliver the stores within the time specified in the Contract or any extension thereof, the purchaser shall recover from the Contractor as liquidated damages a sum of one-half of one percent (0.5 percent) of the Contract price of the undelivered stores for each calendar week of delay. The total liquidated damages shall not exceed ten percent (10 percent) of the Contract price of the unit or units so delayed. Stores will be deemed to have been delivered only when all their component parts are also delivered. If certain components are not delivered in time, the stores will be considered as delayed until such time as the missing parts are delivered. Delivery of stores shall be complete on Installation, commissioning, Testing and Acceptance.	Yes / No / Explain	
12	Quantity variation: The quantities indicated against each item in the Bill of Quantities (BOQ) are indicative and are for the purpose of bidding only. Variation in quantities upto plus 25% shall be carried out by the contractor on the agreed/Purchase Order (PO) rates and terms & conditions as in the Purchase Order (PO). In case of contract items which exceed the said limit of plus 25%, the contractor may claim revision of rates supported by proof, analysis and if the rate claimed in excess of the rate specified in the bill of quantities, SCL s profit & OH shall be factored in the rate analysis @15%	Yes / No / Explain	
13	Extra Items: In case of extra items (that are completely new and are in addition to the items contained in the contract), the contractor may claim rates supported by proper analysis and SCLs engineer-in-charge of the work shall, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of market rates and the contractor shall be paid in accordance with the rates so determined. The Contractors profit & OH shall be factored in the rate analysis@15%.	Yes / No / Explain	

14	EXTENSION OF TIME : If the completion of supply of stores is delayed due to reason of force majeure such as acts of god, acts of public enemy, acts of Government fires floods epidemics quarantine restriction strikes freight embargoes etc., the Contractor shall give notice within 15 days to the purchaser in writing of his claim for an extension of time. The purchaser on receipt of such notice after verification, if necessary may agree to extend the Contract delivery date as may be reasonable but without prejudice to other terms and conditions of the Contract.	Yes / No / Explain	
15	Labour Law: Contractor shall abide by all labour laws, rules and regulations in India, which are prevailing, and as enforced from time to time and SCL shall not be responsible for any accident or mishap during the course of the contract to any of engineer/ labour employee by the Contractor. The contractor shall also ensure that the statutory obligations with regards to the employment of labour under law are complied properly and timely.	Yes / No / Explain	

16	ARBITRATION: In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Contract, such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Offices of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in New Delhi in the Arbitration and Conciliation Centre New Delhi (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only. Work under the Contract shall be continued by the CONTRACTOR during the pendency of arbitration proceedings, without prejudice to a final adjustment in accordance with the decision of the Arbitrator unless otherwise directed in writing by the DEPARTMENT or unless the matter is such that the works cannot be possibly continued until the decision (whether final or interim) of the Arbitrator is obtained.	Yes / No / Explain	
17	APPLICABLE LAWS: The contract shall be interpreted, construed and governed by laws of India. The contract shall be subject to exclusive Jurisdiction of the Court of SAS Nagar (Mohali), Punjab, India irrespective of anything mentioned in any correspondences or otherwise.	Yes / No / Explain	

18	The Participating Vendor / Suppliers /Service Provider shall indicate specifically whether they fall in the category of Class-I local Supplier or Class-II Local Supplier or Non - Local Supplier for evaluation as per Ministry of Commerce and Industry Office Order No. P-45021/2/2017-PP (B-II dt. 16th September 2020. The Provisions of the office order shall apply for this tender. The Vendor/Supplier/Service provider shall submit documentary proof in this regard along with their quotation.	Yes / No / Explain	
19	The Class-I/Class-II Local suppliers, at the time of submitting their offer, shall also indicate percentage of local content and provide self-certification that the item (s) offered meets the local content requirement for Class-I/Class-II Local Suppliers as the case may be. Vendor shall also give details of location (s) at which the local value addition is made.	Yes / No / Explain	
20	Any Other Term:	Yes / No / Explain	

C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	Installation of 415 V horizontal type MCB distribution board	5.00 Nos.		-		
2	Supply of 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB), 3 phase, 415 V	1.00 Nos.		-		
3	Installation of 8-Way vertical type MCCB Sub-Main Distribution Board (SMDB), 3 phase, 415 V	1.00 Nos.		-		

4	Supply of 3.5Cx300 Sq. mm Aluminium conductor	770.00 m		-		
5	Laying of 3.5Cx300 Sq. mm Aluminium conductor on existing wall/surface/ Cable Tray	650.00 m		-		
6	Supply of 4Cx70 Sq. mm Aluminium conductor	300.00 m		-		
7	Supply of 3 Phase 415 V MCC panel	1.00 Nos.		-		
8	Installation, Testing and Comissioning of 3 Phase 415 V MCC panel 1	1.00 Nos.		-		
9	Supply of horizontal 415 V MCB distribution board	5.00 Nos.		-		
10	Laying of 3.5Cx300 Sq. mm Aluminium conductor direct in ground	100.00 m		-		
11	Laying of 3.5Cx300 Sq. mm Aluminium conductor inin the existing RCC/ HUME/ METAL pipe as required.	20.00 m		-		
12	Laying of 4Cx70 Sq. mm Aluminium conductor	300.00 m		-		
13	Supply of 4Cx10 Sq. mm Aluminium conductor	750.00 m		-		

14	Laying of 4Cx10 Sq. mm Aluminium conductor on existing wall/surface/ Cable Tray	300.00 m		-		
15	Laying of 4Cx10 Sq. mm Aluminium conductor direct in ground	400.00 m		-		
16	Laying of 4Cx10 Sq. mm Aluminium conductor in the existing RCC/ HUME/ METAL pipe as required.	50.00 m		-		
17	Supply of 3Cx2.5 Sq. mm copper conductor	1000.00 m		-		
18	Laying of 3Cx2.5 Sq. mm copper conductor	1000.00 m		-		
19	Supply of 12Cx2.5 Sq. mm copper conductor	500.00 m		-		
20	Laying of 12Cx2.5 Sq. mm copper conductor	500.00 m		-		
21	Supply of 12 Pair instrument Cu cable	100.00 m		-		
22	Laying of 12 Pair instrument Cu cable	100.00 m		-		
23	Supply of end termination of 3.5Cx300 Sq. mm Aluminium cable	2.00 Nos.		-		

24	making of end termination of 3.5Cx300 Sq. mm Aluminium cable	2.00 Nos.		-		
25	Supply of end termination of 3.5Cx70 Sq. mm Aluminium cable	2.00 Nos.		-		
26	making end termination of 3.5Cx70 Sq. mm Aluminium cable	2.00 Nos.		-		
27	Supply of end termination of 4 Cx10 Sq. mm Aluminium	26.00 Nos.		-		
28	making of end termination of 4 Cx10 Sq. mm Aluminium	26.00 Nos.		-		
29	Supply of end termination of 3Cx2.5 Sq. mm copper conductor	20.00 Nos.		-		
30	making of end termination of 3Cx2.5 Sq. mm copper conductor	20.00 Nos.		-		
31	Supply of end termination of 12Cx2.5 Sq. mm copper conductor	20.00 Nos.		-		
32	making of end termination of 12Cx2.5 Sq. mm copper conductor	20.00 Nos.		-		
33	Supply of end termination of 12 Pair instrument Cu cable	30.00 Nos.		-		

34	making of end termination of 12 Pair instrument Cu cable	30.00 Nos.		-		
35	Supply of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting	50.00 Nos.		-		
36	Installation of flame/explosion proof high efficiency 1 Phase 230 V, 60W LED light fitting	50.00 Nos.		-		
37	Supply of wall/ceiling mounted batten type 20W LED tube light luminaire with efficient driver	11.00 Nos.		-		
38	Installation of wall/ceiling mounted batten type 20W LED tube light luminaire with efficient driver	11.00 Nos.		-		
39	Supply of 1 or 2 Module GI box along with modular base and cover plate for modular switches	5.00 Nos.		-		
40	Instllation of 1 or 2 Module GI box along with modular base and cover plate for modular switches	5.00 Nos.		-		

41	Supply of 6 Module GI box along with modular base and cover plate for modular switches	10.00 Nos.		-		
42	Installation of 6 Module GI box along with modular base and cover plate for modular switches	10.00 Nos.		-		
43	Supply of 8 Module GI box along with modular base and cover plate for modular switches	5.00 Nos.		-		
44	Installation of 8 Module GI box along with modular base and cover plate for modular switches	5.00 Nos.		-		
45	Supply of 5/6 Amp modular switch	20.00 Nos.		-		
46	Installation of 5/6 Amp modular switch	20.00 Nos.		-		
47	Supply of 5/6 Amp modular socket	20.00 Nos.		-		
48	Installation of 5/6 Amp modular socket	20.00 Nos.		-		
49	supply of 3 X 1.5 sq. mm wire along with conduit for wiring	200.00 m		-		
50	Installtion of 3 X 1.5 sq. mm wire along with conduit for wiring	200.00 m		-		

51	supply of 3 X 2.5 sq. mm wire along with conduit for wiring	100.00 m		-		
52	Installtion of 3 X 2.5 sq. mm wire along with conduit for wiring	100.00 m		-		
53	Supply of 20 A, 240 V, SPN Industrial type socket	5.00 Nos.		-		
54	Installation of 20 A, 240 V, SPN Industrial type socket	5.00 Nos.		-		
55	Supply of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan	3.00 Nos.		-		
56	Installation of 300mm sweep 1400 rpm, heavy duty, totally enclosed motor type Exhaust fan	3.00 Nos.		-		
57	Supply of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch	10.00 Nos.		-		
58	Installation of flame/explosion proof single phase double Pole 230V, 10 A, rotary switch	10.00 Nos.		-		
59	Supply of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable	6.00 Nos.		-		

60	Installation of flame/explosion proof single phase 230V, 10A, junction box for loop in loop out of the cable	6.00 Nos.		-		
61	Supply of 50 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray	50.00 m		-		
62	Installing of 50 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray	50.00 m		-		
63	Supply of 100 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray	100.00 m		-		
64	Installing of 100 mm width X 50 mm depth X 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray	100.00 m		-		

65	Supply of 300 mm width x 50 mm depth x 1.6 mm thickness size of perforated Hot, Dipped Galvanised Iron cable tray	100.00 m		-		
66	Installation of 300 mm width X 50 mm depth X 1.6 mm thickness perforated, hot dipped Galvanised Iron cable tray	100.00 m		-		
67	Supply of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc.	8.00 Nos.		-		
68	Installation of hot dipped galvanized swaged tubular 9-meter-long with Junction Box, Muff, earthing etc.	8.00 Nos.		-		
69	Supply of 72W/75W LED Street Light fixture	8.00 Nos.		-		
70	Installation of 72W/75W LED Street Light fixture	8.00 Nos.		-		
71	Supply of G.I. tape 20 mm X 3 mm thick on parapet or surface of wall	210.00 m		-		
72	Fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall.	150.00 m		-		

73	Fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required (for vertical run).	60.00 m		-		
74	Supply of testing joint, made of 20 mm X 3 mm thick G.I. strip	4.00 Nos.		-		
75	Fixing testing joint, made of 20 mm X 3 mm thick G.I. strip	4.00 Nos.		-		
76	Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod	6.00 Nos.		-		
77	I/T/C of Earthing with maintenance free copper coated Earth rod of 3 Mtr length 20 mm dia earth rod	6.00 Nos.		-		
78	Supply of 6 SWG dia G.I. wire	50.00 m		-		
79	Fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	50.00 m		-		
80	Supply of 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode	130.00 m		-		
81	Laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode	130.00 m		-		

82	Supplying 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required	100.00 m		-		
83	Fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required. -	100.00 m		-		
84	Supply of accessories for Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick	2.00 Nos.		-		
85	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick	2.00 Nos.		-		
86	Supply 25 mm X 5 mm copper strip as strip earth electrode	230.00 m		-		
87	Laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode	230.00 m		-		
88	Supply of 4 mm dia copper wire (Green yellow colour)	100.00 m		-		
89	Fixing 4 mm dia copper wire (Green yellow colour)	100.00 m		-		
90	Supply of 10 mm dia copper wire (Green yellow colour)	100.00 m		-		

91	Fixing 10 mm dia copper wire (Green yellow colour) on surface or in recess for loop earthing of motor	100.00 m		-		
92	Supply of ISI mark 300mm dia RCC pipe NP2 class (light duty)	20.00 m		-		
93	Laying and fixing ISI mark 300mm dia RCC pipe NP2 class (light duty)	20.00 m		-		
94	Supply of junction box , single front construction , Powder coated IP 54	2.00 Nos.		-		
95	Installation , testing and Commissioning of junction box , single front construction , Powder coated IP 54	2.00 Nos.		-		
96	Supply of Local Push Button stations (LPBS)	5.00 Nos.		-		
97	Installation testing and commissioning of Local Push Button stations (LPBS)	5.00 Nos.		-		
98	Supply of microprocessor based, 2-loop Analog addressable type fire alarm control panel (FACP)	1.00 Nos.		-		

99	Installation, testing and commissioning of microprocessor based, 2-loop Analog addressable type fire alarm control panel (FACP) -	1.00 Nos.		-		
100	Supply of Addressable multisensor type smoke detector	20.00 Nos.		-		
101	Installation testing and commissioning of Addressable multisensor type smoke detector	20.00 Nos.		-		
102	Supply of UV IR Sensor for Methanol detection	3.00 Nos.		-		
103	Installation testing and commissioning of UV IR Sensor for Methanol detection	3.00 Nos.		-		
104	Supply of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system	3.00 Nos.		-		
105	Installation testing and commissioning of Switch Monitoring Unit (SMU)/IO Unit to configure the UV IR sensors with fire detection system	3.00 Nos.		-		

106	Supply of addressable, Manual Call Point (MCP)	12.00 Nos.		-		
107	Installation, testing and commissioning of addressable, Manual Call Point (MCP)	12.00 Nos.		-		
108	Supply of addressable loop Sounder	6.00 Nos.		-		
109	Installation, testing and commissioning of addressable loop Sounder	6.00 Nos.		-		
110	Supply 2Cx1.5mm2 Copper, extruded PVC inner sheath cable	1000.00 m		-		
111	Installation of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade	1000.00 m		-		
112	Supply of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade	300.00 m		-		

113	Laying of 2Cx1.5mm2 Copper, extruded PVC inner sheath, armoured and overall FRLS PVC outer sheathed 1.1 KV grade cable	300.00 m		-		
114	Supply of brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable	90.00 Nos.		-		
115	Making end termination with brass compression gland and copper lugs for 2Cx1.5mm2 Copper cable	90.00 Nos.		-		
116	Supply of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block for loop in loop out of 2C x1.5 sq. mm copper armoured cable	40.00 Nos.		-		
117	Installation, testing and commissioning of MS painted powder coated box, Size 4"X4" with ELMEX type terminal block	40.00 Nos.		-		
118	Supply of IP 65 or better, explosion proof/Flame proof loud speaker	6.00 Nos.		-		

119	Installation of IP 65 or better, explosion proof/Flame proof loud speaker	6.00 Nos.		-		
120	Supply of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH)	915.00 m		-		
121	Laying of category 6A or better, 4 pair shielded cable U/FTP or F/UTP in PVC Conduit, sheath type: low smoke zero halogen (LSZH)	915.00 m		-		
122	Supply of CAT6A Patch/Jack Panel of 24 Port unloaded in Network rack with port identification number, with self adhesive clear label holder.	1.00 Nos.		-		
123	Installation testing and commissioning of CAT6A Patch/Jack Panel of 24 Port unloaded in Network rack	1.00 Nos.		-		

124	Supply of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs	24.00 Nos.		-		
125	Installation testing and commissioning of Patch Cords Cat 6A shielded 1 meter in Network rack with 4 pair shielded copper wire	24.00 Nos.		-		
126	Supply of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire, factory pre terminated with shielded RJ45 plugs	24.00 Nos.		-		
127	Installation testing and commissioning of Patch Cords Cat 6A shielded 3 meter in Network rack with 4 pair shielded copper wire,	24.00 Nos.		-		
128	Supply of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category 6A or better,	48.00 Nos.		-		

129	Installation of Shielded Cat 6A information outlet U/FTP or F/UTP, compliance to category 6A or better,	48.00 Nos.		-		
130	Supply of square face plate (Dual) with a provision to support variety of jacks- UTP,STP etc.	7.00 Nos.		-		
131	Installation of square face plate (Dual) with a provision to support variety of jacks- UTP,STP etc.	7.00 Nos.		-		
132	Supply of square face plate (single) with a provision to support variety of jacks- UTP,STP etc.	10.00 Nos.		-		
133	Installation of square face plate (single) with a provision to support variety of jacks- UTP,STP etc.	10.00 Nos.		-		
134	Supply of Network Switch in Network Rack with the following specification as below	2.00 Nos.		-		

135	Installation of Network Switch in Network Rack with the following specification as below	2.00 Nos.		-		
136	Supply of SMB Box for face plate (Dual/Single) as required.	17.00 Nos.		-		
137	Installation of SMB Box for face plate (Dual/Single) as required.	17.00 Nos.		-		
138	Supply of 25mm electrical grade, ISI mark, PVC Conduit	400.00 m		-		
139	Installation of 25mm electrical grade, ISI mark, PVC Conduit in wall/floor/slab /surface including wall/floor cutting and making good the same	400.00 m		-		
140	Supply of OFC SM OS2 Cable in existing 32mm HDPE pipe as required	150.00 m		-		
141	Installation of OFC SM OS2 Cable in existing 32mm HDPE pipe as required	150.00 m		-		
142	Supply 32mm HDPE pipe	150.00 m		-		

143	Laying of 32mm HDPE pipe direct in ground including excavation, sand cushioning, protective covering and refilling the trench	150.00 m		-		
144	Supply of sliding LIU for OFC Termination with tray 1U as required.	2.00 Nos.		-		
145	Installation of sliding LIU for OFC Termination with tray 1U as required.	2.00 Nos.		-		
146	Supply of SC simplex single-mode LSZH pigtail, 1m as required.	48.00 Nos.		-		
147	Installation of SC simplex single-mode LSZH pigtail, 1m as required.	48.00 Nos.		-		
148	Supply of adaptor plate with 3 SC duplex SM adaptors as required.	8.00 Nos.		-		
149	Installation of adaptor plate with 3 SC duplex SM adaptors as required.	8.00 Nos.		-		
150	Trenching of Hard Soil	15.00 m		-		
151	Trenching of Soft Soil	35.00 m		-		

152	Supply of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required	8.00 Nos.		-		
153	Installation of SC-LC duplex single-mode OS2 LSZH patch cord, 3m as required	8.00 Nos.		-		
154	Splicing of OFC as per Core as required.	48.00 Nos.		-		
155	Supply of accessories for making the Chamber Pit- 1Mtr Depth with Lid for housing OFC	2.00 Nos.		-		
156	Installation of accessories for making the Chamber Pit- 1Mtr Depth with Lid for housing OFC as required.	2.00 Nos.		-		