

PROFORMA OF SCHEDULES**SCHEDULE 'A'**Schedule of quantities (as per PWD-3) as per schedule of work attached on **Page 187 to 221****SCHEDULE 'B'****Schedule of materials to be issued to the contractor:-**

S. No.	Description of item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of issue
1	2	3	4	5
		As per Part 'A' of NIT		NIL

SCHEDULE 'C'**Tools and plants to be hired to the contractor:-**

S. No.	Description	Hire charges per day	Place of issue
1	2	3	4
		As per Part 'A' of NIT	NIL

SCHEDULE 'D'**Extra schedule for specific requirements/document for the work, if any: As per Part 'A' of NIT****SCHEDULE 'E'**

Reference to General Conditions of contract	: As per Part 'A' of NIT.
Name of Work	Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.).
Estimated cost of work	: Rs. 96,63,953/- (Electrical & Mechanical Work)
(i) Earnest Money	: As per Part 'A' of NIT
(ii) Performance Guarantee	: As per Part 'A' of NIT
iii) Security deposit	: As per Part 'A' of NIT

SCHEDULE 'F'**GENERAL RULES & DIRECTIONS :****Officer inviting tender : As per Part-A of NIT**

Maximum percentage for quantity of items of work to be executed beyond which rates are to determined in accordance with

As per Part-A of NIT

CORRECTION	NIL	INSERTION	NIL
CUTTING	NIL	OVERWRITING	NIL
		AE(E)	EE(C)

- Clauses 12.2 & 12.3.** :
- Definitions** :
- 2(v) Engineer -in- Charge** : **The Executive Engineer (E), CPWD, Raipur or his successor.**
- 2(viii) Accepting Authority** : **Chief Engineer, CPWD, Raipur or his successor.**
- 2(x) Percentage on cost of materials and Labour to cover all overheads and profits** : **15%**
- 2(xi) Standard Schedule of Rates** : **DSR (E&M)- 2025**
- 2(xii) Department** : **CPWD**

9(ii) Standard CPWD Contract Form : **As per Part 'A ' of NIT**

Clause 1

(i)Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptances : **As per Part 'A ' of NIT**

(ii)Maximum allowable extension beyond the period provided in (i) above : **As per Part 'A ' of NIT**

Clause 2

Authority for fixing compensation under clause 2 : **As per Part 'A ' of NIT**

Clause 2A

Whether Clause 2A shall be applicable : **As per Part 'A ' of NIT**

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start : **As per Part 'A ' of NIT**

TABLE OF MILESTONE (S)

Electrical & Mechanical Services

Sub Work-Pdg. Electrical& Mechanical Services

S. No.	Description of milestone (Physical)	Time allowed in days (from date of start) along with progress of civil works.	Amount to be withheld in case of non-achievement of milestone (% of tendered amount of respective Electrical component)
As per Part-A of NIT			

Time allowed for execution of work : **As per Part 'A ' of NIT**

Authority to decision

(i) Extension of time : **As per Part 'A ' of NIT**

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

(ii) Rescheduling of mile stones : As per Part 'A' of NIT

Clause 7

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment

: As per Part – 'A' of NIT

Clause 10A

List of testing equipment to be provided by the contractor at site lab.

1.LT/HT Megger 2. Earth Tester 3. Tongue Tester
4. Lux meter 5. Multi meter. 5. Screw Gauge 6.
Vernier Caliper

Clause 10B (ii)

Whether Clause 10 B (ii) shall be applicable : As per Part 'A' of NIT

Clause 10C

Component of labour expressed as percent
of value of work

: As per Part 'A' of NIT

Clause 10CA

S. Nos.	Material covered under this clause	Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed	Base price of all materials covered under clause 10 CA*
As per Part 'A' of NIT			

Clause 10 CC

Clause 10 CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column

: As per Part 'A' of NIT

Schedule of component of other Materials, Labour, POL etc. for price escalation. Component of civil (except materials covered under clause 10CA) /Electrical construction Materials expressed as percentage of total value of work.

: As per Part 'A' of NIT

Clause 11

Specifications to be followed for execution of work :

1. CPWD General Specifications for Electrical Works, Part I Internal – 2023
2. CPWD General Specifications for Electrical Works, Part II External – 2023
3. CPWD General Specifications for Electrical Works, Part V Wet Riser & Sprinkler Systems – 2020
4. CPWD General Specifications for Electrical Works, Part VI Fire Detection and Alarm System – 2018
5. CPWD General Specifications for Electrical Works, Part VII D.G. Sets – 2013& Amendment up to date.
6. CPWD General Specifications for Electrical Works, Part VIII Gas Based Fire Extinguishing System-2013
7. General Specifications for Heating, Ventilation & Air-Conditioning (HVAC) – 2024

Clause 12

Type of Work:

As per Part 'A' of NIT

CORRECTION	NIL	INSERTION	NIL
CUTTING	NIL	OVERWRITING	NIL
AE(E)		EE(C)	

12.2. & 12.3

Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building work

: As per Part 'A' of NIT

12.5

Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work

: As per Part 'A' of NIT

Clause 16

Competent Authority for deciding reduced rates

: Chief Engineer, CPWD, Raipur or his successor.

Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site

: 1. Screw Gauge 2. Vernier Caliper 3. Chase cutting machine 4. Conduit bending machine & crimping tool. 5. Welding Machine 6. Assorted sizes of Ladder.

Clause 25

Constitution of Dispute Redressal Committee (DRC): As per Part 'A' of NIT

Clause 31/31A: As per Part 'A' of NIT

Clause 32 (i)

Requirement of Technical staff and recovery Rate: -

S. No	Minimum Qualification	Number	Minimum experience (years)	Designation	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36 (i)	
					Figures	Words
As per Part 'A ' of NIT						

Assistant Engineers retired from Government service holding Diploma will be treated at par with Graduate Engineers.

Clause 42 : As per Part 'A' of NIT

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION: -

S. Nos.	Description	Rates in figures and words at which recovery shall be made from the contractor	
		Excess beyond permissible variation	Less use beyond permissible variation
As per Part 'A ' of NIT			

ELIGIBILITY CRITERIA FOR MINOR COMPONENTS (E&M)

1. The successful bidder should either himself meet the eligibility conditions for the respective E&M components or otherwise he will have to associate with agencies, fulfilling the eligibility requirements and hence consent letter from at least **One** eligible Associate Agency of the respective components of E&M work shall also be submitted as per attached **Proforma**. The successful bidder shall thoroughly check whether the agency with whom association is proposed meet the eligibility or not before submitting the consent letter.
2. In case the main contractor is himself eligible (as per eligibility criteria) for executing any specific minor component and intends doing the job himself, he may not be required to associate with another agency for that minor component of work. In such cases the main contractor also has to submit the documents as per eligibility criteria mentioned for associated agency of individual E&M component.
3. Main agency shall have to submit credentials of the proposed associated agencies for verification and approval of the department in pro-forma at '**Form-H**' and Consent letter as per '**Form-G**'. After approval of agency by the Engineer-in-charge of minor component, the main contractor submit MOU with each of the associated agency in pro-forma at '**Form-I**' within 30 days from the date of issue of award letter.
4. The main contractor has to submit the following documents for association of electrical contractor within one month of award of work or 15 days before start of electrical related work whichever is earlier.
 - (i) In support of the eligibility conditions of the proposed associated electrical contractor, copy of their registration documents, Electrical Contractor's License, PAN Card, GST Registration duly attested by the applicants (Main Contractor) shall be submitted to the **EE, Raipur**, who will submit these documents to the **Executive Engineer (Electrical), CPWD, Raipur**, for deciding the eligibility within seven days of receipt of the same. Each such electrical contractor will certify that they are not debarred as on the day of association with the main contractor. Proposal for associating agency for minor components of work shall be submitted in Form- "H" of this tender document from each associate independently for all electrical and mechanical components.
 - (ii) After approval of the associate contractor, the main contractor will submit separate MOU signed with each of associate contractor associated with the main contractor. The MOU in the enclosed form shall be signed by both the parties' i.e. main contractor as 1st party and associated electrical contractor as 2nd party, independently for all electrical and mechanical components.
5. In the event of the concerned associated contractor not performing satisfactorily or failure of associate contractor to complete the E&M work, the main contractor, on written directions of the department, shall remove the Associate contractor deployed on the work and shall submit name of new associate who fulfil the conditions mentioned in NIT to execute the left-over work without any loss of time or variation in cost to the department. Such associates shall also give an undertaking along with the main tenderer that both of them shall stand guarantee for which payment has been released by the Department in part for any equipment supplied for the work, during the currency of the earlier Associate contractor and paid partly by the Department. Also, if any such material becomes redundant/ not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of E&M work, the main contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of Electrical Contractor will be allowed without prior approval of the Engineer-in-charge of the work.

6. All technical discussions shall be attended by the associate agencies and the main agency. Commercial/Technical submissions for the electrical works shall be signed and submitted by the associate agencies along with the main agency.
7. The main contractor shall be entirely responsible and answerable for all the works done by his associated electrical agencies regarding their quality, adherence to the laid down specification, terms and conditions, warranty/guarantee etc and he shall be liable to bear any compensation that may be levied by the department under any of the clauses of the agreement. In respect of all Sub-Works of E&M works i.e. **Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.)**.
8. The materials and equipment shall be procured only from the original equipment manufacturers/ authorized dealers of OEM. The contractor shall submit all documentary details in fulfilment of this conditions regarding procurement of materials including relevant test certificates.
9. Executive Engineer (E) shall be the Engineer-in-charge as far as electrical and mechanical works are concerned. Separate tender schedule abbreviated CPWD-7 and Special Conditions for Electrical Work are appended with this tender. It will be obligatory on the part of the contractor/ tenderer to sign the tender documents for all the component parts.
10. The main contractor shall be responsible and liable for proper and complete execution of the Electrical and mechanical work and ensure coordination and completion of both civil and electrical work.
11. The main contractor, who is not having desired experience as per eligibility criteria has to enter into agreement with eligible contractors associated by him for executing of minor components. Copy of such agreement shall be submitted to **Executive Engineer (E)** in charge of minor component as well as Engineer-in-charge of major component.
12. The associate contractor shall attend the inspection of the work by the Engineer –in-charge of E&M works as and when required.
13. No change of Electrical Contractor will be allowed without prior approval.
14. For components of E & M works, the eligibility criteria will be as detailed below.

Sr. No.	Component E&M works	Estimated Cost in Rs.	Eligibility of the Associate Contractor for association
SH-I, II, III, IV, V, VI, VII, VIII, XVIII & XI	Wiring, Fans & LED fitting, MCD & DB's, Earthing, Lightning conductor, LT Panel, cable laying, Street lighting, Air Conditioning System pump set, & water cooler etc.	Rs. 4377100.00	Contractor enlisted in CPWD in composite category and appropriate class having valid electrical license. Or Specialized firms who have satisfactorily completed the Internal Electrical Installation work during the last 7 year ending previous day of the last day of submission of tender as mentioned below. In case of private works the same shall be supported by TDS certificate for the work under consideration along with the document of having satisfactory completed above work to the satisfaction engineer – in- charge.

SH: -XIII	Lift	Rs. 2260860.00	OEM of Lifts having experience of: i) Three Similar completed works each costing not less than of 40% (Rs.9.04 Lakhs) of the estimate cost put to tender OR ii) Two Similar completed works each costing not less than of 60% (Rs. 13.57 Lakhs) of the estimate cost put to tender. OR iii) One Similar completed works each costing not less than of 80% (Rs.18.09 Lakhs.) of the estimate cost put to tender +Similar work shall mean "SITC of Lift."
SH: -XIV	DG Set	Rs. 537996.00	OEM of Lifts having experience of: i) Three Similar completed works each costing not less than of 40% (Rs. 2.15 Lakhs) of the estimate cost put to tender OR ii) Two Similar completed works each costing not less than of 60% (Rs. 3.23 Lakhs) of the estimate cost put to tender. OR iii) One Similar completed works each costing not less than of 80% (Rs.4.30 Lakhs.) of the estimate cost put to tender +Similar work shall mean "SITC of DG Set."
SH: - IX, XVI & XVII	Fire Fighting System, Fire Extinguisher & fire alarm system	Rs. 973151.00	i) Three Similar completed works each costing not less than of 40% (Rs. 3.89 Lakhs) of the estimate cost put to tender. or ii) Two Similar completed works each costing not less than of 60% (Rs. 5.84 Lakhs) of the estimate cost put to tender. or iii) One Similar completed works each costing not less than of 80%(Rs.7.79 Lakhs.) of the estimate cost put to tender. Similar work shall mean "SITC Fire Fighting & Fire Alarm System"
SH: - X & XII	CCTV, EPABX System & LAN System	Rs. 729862.00	i) Three Similar completed works each costing not less than of 40% (Rs. 2.92 Lakhs) of the estimate cost put to tender. or ii) Two Similar completed works each costing not less than of 60% (Rs. 4.38 Lakhs) of the estimate cost put to tender. or iii) One Similar completed works each costing not less than of 80%(Rs. 5.84 Lakhs.) of the estimate cost put to tender. Similar work shall mean "SITC LAN Networking, EPABX System & CCTV"
SH: - XIII	UPS	Rs. 510806.00	i) Three Similar completed works each costing not less than of 40% (Rs. 2.04 Lakhs) of the estimate cost put to tender.

			or ii) Two Similar completed works each costing not less than of 60% (Rs. 3.06 Lakhs) of the estimate cost put to tender. or iii) One Similar completed works each costing not less than of 80% (Rs. 4.09 Lakhs.) of the estimate cost put to tender. Similar work shall mean “UPS”
SH: - XIV	Solar Photovoltaic Power Plant	Rs. 274114.00	i) Three Similar completed works each costing not less than of 40% (Rs. 1.10 Lakhs) of the estimate cost put to tender. or ii) Two Similar completed works each costing not less than of 60% (Rs.1.64 Lakhs) of the estimate cost put to tender. or iii) One Similar completed works each costing not less than of 80% (Rs. 2.19 Lakhs.) of the estimate cost put to tender. Similar work shall mean “SITC Solar System”

NOTE: -

- Components of work executed other than those included in definition of similar work shall be deducted while calculating cost of similar work. Bidder shall submit abstract of cost of work in support of this.
- For the purpose, “Cost of work” shall mean gross value of the completed work including the cost of material supplied by the Government/ client, but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer/ project manager or equivalent.
- The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, except sub head-I calculated from the date of completion to previous day of last date of submission of tenders.
- For Sub head at Sr. No. Sub Work above the composite contractor shall have to associate other agencies for execution of each of the work, which fulfills the eligibility criteria as cited above for these works duly taking prior approval from the department. However, the Composite category contractor/successful bidder shall also be eligible to carry out himself/herself any or all of these works without associating any specialized agency provided:
 - He fulfills the prescribed eligibility criteria respectively for these works.

or

 - He directly procures the equipment of approved make from manufacturers and get them installed from authorized agency/service provider of the manufacturers or specialized agencies as per criteria mentioned in NIT.

Eligibility criteria of each such agency to be associated is stipulated above.

The composite contractor and the associated specialized agencies shall give required affidavit to confirm their association as Proforma “H” given in part “C” in the tender documents.

Tender accepting authority may approve change of Sub-Agency in case it is required during the currency of the contract.

The main contractor has to submit consent letters as per Form-G, given in Part C of the tender document at least one eligible associate agency of the respective component of E&M work for each of

the component of E&M works by clearly indicating the component of work within 30 days of award of work OR 15 days before start of minor component of work whichever is earlier.

The main contractor will submit MOU signed with eligible registered composite contractor of CPWD or Specialized agency. The MOU in the enclosed Form- "I" shall be signed by both the parties' i.e. main contractor as 1st party and associated electrical contractor as 2nd party, independently for each of the sub-work **Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.).**

If the main contractor fails to associate agency for execution of minor components of work within 30 days of award of work OR 15 days before start of minor components of work whichever is earlier or furnishes incomplete details or furnishes details of ineligible agencies even after the tenderer is given due opportunity, the entire scope of such component of work shall be withdrawn from the tender and the same shall be got executed by the Engineer-in- charge at the risk and cost of the main contractor.

- (i) Verifiable completion certificates of the work, registration/ approval documents as the case may be, duly attested by the applicant shall be submitted within 30 days of award of work OR before start of minor component of work whichever is earlier. Valid Electrical Contractor's license, as the case may be, duly attested by the applicant shall also be submitted within 30 days of award of work OR before start of minor component of work whichever is earlier.
- (ii) Self-attested GST registration documents in respect of the associated agencies shall be submitted within 30 days of award of work or 15 days before start of minor component of work whichever is earlier.

Executive Engineer (E)

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

**CONSENT LETTER FROM ELIGIBLE ASSOCIATE AGENCY OF
MINOR COMPONENT OF WORK**

Name of Work: Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.).

I/ We hereby give my consent to associate with M/s
for executing the minor component of work of (Mention sub-works)

1. I/We will execute the work as per specifications and conditions of the agreement and as per direction of the Engineer –in-charge for the corresponding minor work till the completion of the work.
2. I/We will be responsible for necessary action to handover the installation and for rectification of defects and repair during the defeat liability / warranty period.
3. Also I/We will employ full time technically qualified Engineer/ Supervisor for the minor component of the work as specified in clause 32 for the work. I/We will attend inspection of officers of the department as and when required.

Date:

Signature with date of Major Contractor

Signature with date of Associate/ Minor Contractor

Contractor

Contractor

Address

Address

1. Witness with address
(From major component contractor side)
2. Witness with address
(From minor component contractor side)

FORM-H**PROPOSAL FOR ASSOCIATING WITH ELIGIBLE AGENCIES FOR
MINOR COMPONENTS OF WORK**

I/We hereby propose the following agencies as per mentioned against each for executing corresponding minor components of work. Their consent letter are also attached.

Sr. No.	Name of Associated Contractor	Category and class of registration	Enlistment copy/ completion Certificates attached	Monetary Limit of work	Validity of registration	Consent letter attached. (Yes/No)
1.						
2.						
3.						
4.						
5.						

Note: Self Attested photocopies of enlistment order, valid electrical contractors license, annual pre-qualification order, work experience certificates of each agency for each component of E&M work shall be submitted.

Signature of contractor

MEMORANDUM OF UNDERSTANDING (M.O.U.)**Rs. 100/- non-judicial stamp****(to be submitted for each and every E&M component)**

1. M/s. (Name of the firm with full address)

Enlistment Status

Valid Upto:

(Henceforth called the main Contractor)

And

2. M/s. (Name of the firm with full address)

Enlistment Status

Valid Upto:

(Henceforth called Associated Electrical Contractor or Electrical Contractor)

For the execution of Electrical work, Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.).

We state that M.O.U. between us will be treated as an agreement and has legality as per Indian Contract Act (amended upto date) and the department (CPWD) can enforce all the terms and conditions of the agreement for execution of above work as per the schedule of work, specifications, term & conditions of the tender. Both of us shall be responsible for the execution of work as per the agreement to the extent this MOU allows. Both the parties shall be paid consequent to the execution as per agreement to the extent this MOU permits. In case of any dispute, either of us will go for mediation by the Engineer –in-charge. Any of us may appeal against the mediation to the Chief Engineer, CPWD, Nagpur. His decision shall be final and binding on both of us.

We have agreed as under:

1. The electrical contractor will execute all electrical works in the wholesome manner as per terms and conditions of the agreement.
2. The electrical contractor shall be liable for disciplinary action if he fails to discharge the action(s) and other legal action as per agreement.
3. All the machinery and equipment, tools and tackles required for execution of the electrical works, as per agreement, shall be the responsibility of the electrical contractor.
4. The site staff required for the electrical work shall be arranged by the electrical contractor or by the main contractor as per terms and conditions of the agreement.
5. Site order book maintained for the said work shall be signed by the main contractor as well as by the Engineer of the Association Contractor and by Associated Contractor himself.
6. All the correspondence regarding execution of the electrical work shall be done by the department with the Associated Contractor with a copy to the main contractor. In case of non-compliance of the provisions of agreement, the main contractor, as well as the associated contractor shall be responsible. The action clauses 2 and 3 shall be initiated and taken against the main contractor.

SIGNATURE OF MAIN CONTRACTOR

SIGNATURE OF ASSOCIATED
ELECTRICAL CONTRACTOR

Date:

Date:

Place:

Place:

1. Witness with address

2. Witness with address

(From major component contractor side)

(From minor component contractor side)

COMMON CONDITIONS FOR ALL MINOR COMPONENTS PART 'C'

The specifications given below pertain to the entire electrical and mechanical works to be carried out **Name of Work: Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.)**. The main agency either shall have valid electrical license or obtain the same at time of execution of electrical work otherwise he has to associate with agency having valid electrical license. The associated agency shall be of the appropriate class eligible to bid for each minor component individually as per the eligible criteria given.

1. The manufacturer's guarantee/warranty for all the electrical installations shall be for minimum period of 12 months except for LED fittings for which the warranty is for Five years, from the date of taking over of the completed work by the department. Necessary documents of handing / taking over of the work will be duly signed by the three parties namely EE (E) or his representative AE/JE, the main contractor and the associate contractor(s).
2. The equipment or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge. In case, it is felt by the department that undue delay is being made by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-Charge in this regard shall be final. The firm shall be required to attend the breakdown calls as and when required and also ensure timely periodical checks for Electrical and Mechanical works executed as per CPWD Specifications and standard trade practices
3. The defect liability period for the entire work is one year, except for LED fittings. The warranty for LED fittings including driver is 5(Five) years. **Before completion of defect liability period of one year for the entire work, the main contractor has to submit Security Deposit of 5% of the price quoted by him for SITC of LED fittings for the remaining 4 years warranty period in acceptable form i.e. FDR/Bank guarantee/DD to the concerned Executive Engineer (E). The Security Deposit deducted from the bills of contractor shall be refunded to the main contractor only after submission of Security Deposit for LED fittings to Executive Engineer (E), failing which this Security Deposit towards LED fittings at 5% of the price quoted by them for LED fittings shall be deducted from Security Deposit for total work and balance amount will be refunded only after completion of defect liability period of one year. The LED Security Deposit will be released after completion of warranty period of 5 years.**
4. Panel drawings with details shall be got approved from the Engineer-in-charge before fabrication.
5. All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not. Nothing extra on account of same shall be paid.
6. **DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER:**

The successful tenderer would be required to submit the following as per 'Milestone' for approval before commencement of installation:

- i. Technical literature / catalogue / brochures of all equipment to Engineer –In-Charge. Only after approval, tenderer should place order for equipment and bring it to site.
- ii. All general arrangement drawings.
- iii. Complete layout dimensions for every unit/group of units with dimensions required for erection purposes.
- iv. Any other drawing/information not specifically/mentioned above but deemed to be necessary for the job by the contractor.

CORRECTION	NIL	INSERTION	NIL		
CUTTING	NIL	OVERWRITING	NIL	AE(E)	EE(C)

- v. Layout plan.

7. INSPECTION AND TESTING:

- a) Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturer's premises shall be furnished to the Engineer-in-Charge.
- b) After completion of the work in all respect the contractor shall offer the installation for testing and commissioning.

8. STATUTORY APPROVALS:

All mandatory statutory approvals/certificates/license/permissions from commencement to commissioning of E & M components shall be obtained by the Contractor from the local body authorities, Chief Fire Officer, Central Electricity Authority etc. as required. However, the Department shall pay necessary fees in connection with these approvals, if any

The contractor shall submit the completion plan separately in triplicate coloured print with two sets of soft copies in compact disc/pen drive in AutoCAD / revit software

The successful contractor shall prepare a list of equipment and materials selected from the approved list, proposed to be used by him for execution of the contract. Before placing orders on suppliers or delivering the equipment and materials at site, the Contractor shall obtain approval from Engineer-in-Charge, whose choice will be final and binding on the Contractor.

Any Equipment or materials not specified under here but required for execution of the work shall be as per Technical specification, of the best quality, with ISI wherever applicable and from a reputed manufacturer and shall be got approved by the Engineer-in-Charge before placing order for delivery of item at site.

9. Data and Programme to be furnished by the tenderers:

The Contractor shall prepare the programme chart for the execution of the work showing clearly all activities from the start of work to the completion required for the completion of the work within the stipulated period and submit the same to the Engineer-in-Charge within fifteen days after the issue of letter for commencement of the work. The Contractor shall also submit monthly programme and progress reports and update / re-schedule the same every month. These shall be submitted by the contractor in soft copy also besides forwarding hard copy of the same.

10. Order of Preference:

Should there be any difference or discrepancy between the description of items as given in the Schedule of Quantities, technical specifications for individual items of work (including additional and commercial conditions) and IS Codes etc., the following order of preference shall be followed:

- a) Schedule of quantities
- b) Commercial and Additional conditions for this work
- c) Drawings.
- d) General Conditions of Contract for CPWD Works.
- e) CPWD General Specifications of corresponding component.
- f) Relevant IS or any other International code in case IS code is not available

- A reference made to any Indian Standard Specifications in these documents, shall imply reference to the latest version of that standard, including such revisions/amendments as issued by the Bureau of Indian Standards up to last date of submission of tenders. The contractor shall keep at his own cost all such publications of relevant Indian Standards applicable to the work at site.
- The main agency shall be responsible for all acts of omissions and submissions of the electrical contractor or sub-contractor engaged by him, even with approval of department. In the event of the concerned E&M agency not performing

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

satisfactorily or failure of associate/sub-contractor to complete the E&M work, the main contractor on the written direction of the department, shall remove the Associate/sub-contractor deployed on the work and shall submit name of new associate who fulfil the conditions mentioned in NIT to execute the leftover work without any loss of time or variation in cost to the department in this regard. Such associates shall also enter into agreement / contract with the main contractor and shall meet all the guarantee for the equipment already supplied for which payment has been released by the Department in part or full

- If any equipment supplied for the work, during the currency of the earlier associate / sub contractor and paid in part or full by the department, becomes redundant or not in a position to be installed and commissioned and put to beneficial use, the main contractor shall be liable for replacement of such equipment(s) at no cost to department. Prior approval of Engineer-in-charge is required for change in associated contractor.
- The main contractor shall not indulge in procurement of items and getting the work done on labour contract with the associate electrical contractor. The whole E&M component shall be executed by the eligible associate electrical contractor on a turnkey basis i.e. procurement of material, engaging labour, execution, testing & commissioning etc. The associate electrical contractor shall submit the completion certificate of E&M work executed by him along with necessary test reports, guarantee bond/certificate, completion plan etc.
- The main contractor shall be responsible and liable for proper and complete execution of all components of work. Main contractor is also responsible to ensure coordination among various associates / sub-contractor to complete the whole scope of work.
- The associate or sub-contractor shall attend the inspection of the work by the Engineer-in Charge of E&M works as and when required.
- Approval of the Engineer-in-charge shall be taken well in advance for all the materials to be supplied and used in all the works by the contractor.

11. Works to be done by the contractor:

Unless and otherwise mentioned in the tender documents, the following works shall be done by the contractor, and therefore their cost shall be deemed to be included in their tendered cost: -

- (i) Foundations for equipment and components where required, including foundations bolts.
- (ii) Cutting and making good all damages caused during installation and restoring the same to their original finish.
- (iii) Sealing of all floor openings provided by him for pipes and cables, from fire safety point of view, after laying of the same.
- (iv) Painting at site of all exposed metal surfaces of the installation other than pre-painted items like fittings, fans, switchgear/distribution gear items, cubical switchboard etc. Damages to finished surfaces of these items while handling and erection, shall however be rectified to the satisfaction of the Engineer-in-Charge.
- (v) Testing and commissioning of completed installation.

12. Storage and Custody of Material.

The contractor has to make his own arrangements for the storage of the material at site & necessary watch and ward of the same till handing over of the complete work to the department. No extra claim for this will be entertained

13. Electric Power Supply and Water Supply:

Power and water supply shall be arranged by the contractor for the execution of the work.

14. Tools for handling and Erecting:

All tools and tackles required for handling of equipment and materials at site of work as well as for their assembly and erection and also necessary test instruments shall be the responsibility of the contractor.

15. Payment Terms:

Payment shall be made as per the relevant clauses of form PWD 7/8 forming part of the tender documents.

16. SECURITY DEPOSIT

A sum @2.5% of the gross amount of the bill shall be deducted from each running bill of the contractor, till the sum along with the sum already deposited as earnest money amounts to security deposit @ 2.5% of the tendered amount of the work. Such deductions shall be made unless the contractor has deposited the amount of security at the rate mentioned in cash or Government securities or Fixed Deposit Receipts. This is in addition to the performance guarantee that the contractor is required to deposit.

Security deposit shall be released only after the completion of the whole agreement.

Running payment for Electrical/Mechanical components shall be made by the EE (E) directly to the main Contractor. The main contractor shall make the payment to associated Contractor within 15 days of receipt of each running account payment. In case of failure of above, action will be taken as per GCC.

17. Co-ordination with other agencies:

The work will be carried out in close coordination with the building work and other agencies, so as the work of other agencies are not hindered. Conduits will be laid in the slab within the specified time and it will have to be ensured that the casting of slabs is not delayed for want of laying of conduits. The conduits will also be laid in walls before the Plaster work is undertaken so as to avoid breaking cutting of plaster while making chase for laying of conduits subsequently. The contractor will have to employ adequate labour for carrying out the work. No claim regarding the idle labour for any reason will be entertained by the Department. The main contractor shall be responsible for coordinating the activities of all works and essential progress of works as per milestone and laid down programme.

18. Care of buildings:

Care shall be taken by the contractor to avoid damage to the building during execution of his part of the work. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove, at his costs, all unwanted and waste materials arising out of his work, from the site.

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

19. Structural Alterations to Buildings:

- a. No structural member in the building shall be damaged/altered, without prior approval from the competent authority through the Engineer-in-charge.
- b. Structural provisions like openings, cutouts, if any, provided by the department for the work, shall be used. If any modifications or fresh provisions are required, such contingent works shall be carried out by the contractor at his cost after approval of the engineer-in-charge.
- c. All such openings in floors provided by the department shall be closed by the contractor after installing the cables/conduits/rising mains etc. as the case may be, by any suitable means as approved by the Engineer-in-charge without any extra payment.
- d. All chases required in connection with the electrical works shall be provided and filled by the contractor at his own cost to the original architectural finish of the buildings.

20. Addition to an installation:

Any addition, temporary or permanent, to the existing electrical installation shall not be made without a properly worked out scheme/design by a qualified Electrical Engineer to ensure that such addition does not lead to overloading, safety violation of the existing system.

21. Drawings:

The work shall be carried out in accordance with the drawings and the tender documents and also in accordance with modification thereto from time to time as approved by the Engineer-in charge.

- a. All wiring diagrams shall be deemed to be 'Drawings' within the meaning of the term as used in Clause 11 of the conditions of contract (PWD 7 or PWD 8). They shall indicate the main switch board, the distribution boards (with circuit numbers controlled by them), the runs of various mains and sub mains and the position of all points with their controls.
 - b. All circuits shall be indicated and numbered in the wiring diagram and the points shall be given the same number as the circuit to which they are electrically connected.
 - c. After award of the work, the firm will be required to submit the drawings for the proposed work including layout plan, conduit routes etc. Work will be carried out as per the approved drawings.
22. The contractor shall take all safety precautions to avoid accidents by exhibiting caution boards, red flags, red lights and by providing necessary barriers and all other measures required from time to time. The contractor shall be responsible for all damages and accidents due to negligence on his part.
23. The contractor shall give due notices to Municipality, Police and/or other authorities that may be required under the law/rules under force and obtain all requisite permissions/licenses for temporary obstructions/enclosures and pay all charges which may be leviable on account of his execution of the work under the agreement. Nothing extra shall be payable on this account.
24. All tools, plant and machinery provided by the contractor shall, when brought at the site, be deemed to be exclusively intended for the construction and completion of this work and the contractor shall not remove the same or any part thereof (save for the purpose of moving it from one part of the site to another) without the consent of the Engineer-in-charge.

25. All materials shall be got checked & approved by the Engineer-in-charge on receipt of the same at site before use in the work. The rejected material is to be removed from the site immediately.
26. No foreign exchange shall be made available by the department for the purchase of equipment, plants, machinery, materials of any kind or any other items required to be carried out in execution of work.
27. The contractor shall give the Engineer-in-charge in every fortnight, a progress report of the work done during the previous fortnight and the targets for the next fortnight. The progress of work will be reviewed periodically by the Engineer-in-Charge with the contractor and shortfalls, if any, sorted out. The contractor shall thereupon take such action as may be necessary to bring back his work to schedule without any additional cost to the department.
28. It shall be responsibility of the main contractor to sort out any dispute involved with the associated contractor without any time and cost overrun to the department. The main contractor shall be solely responsible for settling the dispute/litigation arising out of his agreement with the associate contractor. The contractor shall ensure that the work shall not suffer on this account.
29. The contractor will have to ensure that the skilled labour i.e., wireman etc., engaged in the execution of the work must possess valid electrical license, otherwise he will not be permitted to execute the work.
30. The associate contractors executing the electrical works must possess the valid electrical contractor license otherwise they will not be permitted to execute the electrical works.
31. The contractor shall be responsible for removal of all defects in the work during the defect liability/guarantee/warranty period. The department shall carry out routine maintenance only. However, if any failure is noticed during this period which is attributable to poor quality of material and bad workmanship, the contractor will be required to rectify the same at his own cost, failure of which the department will be at liberty to get the defects rectified at the risk & cost of the contractor. The contractor will also be required to carry out his own inspection/testing during the guarantee/warranty period and attend to any defect taking place during this period.
32. Material required for the work shall be brought at site at the appropriate time keeping in view the requirement of material depending on progress of the work.

33. For Specialized E&M Original Works and other original E&M Works:

The successful tenderer is to submit, along with the proposal for approval of make for specialized work after the acceptance of tender, an undertaking from the OEM regarding:

- (a) Authorization certificate.
- (b) The OEM is unconditionally support the lowest tenderer technically throughout the execution of contract as well as for Maintenance/ Comprehensive Maintenance Contract for the useful life of the system, and OEM is provide all the spares required for healthy functioning of the equipment for at least seven years from the date of supply of equipment

34. BYE-LAWS AND REGULATIONS

The work shall be carried out to the satisfaction of the Owner's site representative and in accordance with the Specifications, Regulations of the Electric Supply Authority, Indian Electricity Rules and Regulations, latest Indian Standards and as per the requirements of the Chief Fire Officer.

35. SHOP DRAWINGS

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

- i. All the shop drawings shall be prepared on computer through AutoCAD System based on Architectural Drawings, site measurements and Interior Designer's Drawings. Within eight weeks of the approval of the associate, contractor shall furnish, for the approval of the engineer-in-charge, two set of detailed shop drawings of all equipment and materials including layouts for all conduit layouts, distribution panels, and any other requirement to be fabricated or purchased by the contractor.
- ii. These shop drawings shall contain all information required to complete the Project as per specifications and as required by the engineer-in-charge. These drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each shop drawing shall contain tabulation of all measurable items of equipment/ materials/ works and progressive cumulative totals from other related drawings to arrive at a variation-in-quantity statement at the completion of all shop drawings. Each item of equipment/material proposed shall be a standard catalogue product of an established manufacturer strictly from the list of approved manufacturers attached in these minor components. When the engineer-in-charge makes any amendments in the above drawings, the contractor shall supply two fresh sets of drawings with the amendments duly incorporated along with check print, for approval. The contractor shall submit further six sets of shop drawings to the engineer-in-charge. No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/ installation.
- iii. Shop drawings shall be submitted for approval sufficiently in advance of planned delivery and installation of any material to allow engineer-in-charge ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved programme.
- iv. Manufacturers' drawings, catalogues, pamphlets and other documents submitted for approval shall be in four sets. Each item in each set shall be properly labelled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted.
- v. Samples of all materials like conduits, accessories, switches, wires, control cables etc shall be submitted to the engineer-in-charge prior to procurement. These shall be submitted in two sets for approval and retention by engineer-in-charge and shall be retained for reference and verification till the completion of the Project.
- vi. Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirement to furnish material and perform work as required by the contract.
- vii. Where the contractor proposes to use an item of equipment, other than that specified or detailed on the drawings, which requires any redesign of the structure, partitions, foundation, wiring or any other part of the mechanical, electrical or architectural layouts; all such re-design, and all new drawings and detailing required therefore, shall be prepared by the contractor at his own expense and gotten approved by the engineer-in-charge.

- viii. The contractor shall prepare composite working drawings and sections at a suitable scale, not less than 1:50, clearly showing how his work is to be installed in relation to the work of other trades. If the Contractor installs his work before coordinating with other trades, or so as to cause any interference with work of other trades, he shall make all the necessary changes without extra cost to the engineer-in-charge.
- ix. Within four weeks of approval of all the relevant shop drawings, the contractor shall submit four copies of a comprehensive variation in quantity statement, and itemized price list of recommended (by manufacturers) imported and local spare parts and tools, covering all equipment and materials in this contract.

36. ACCESSIBILITY

The Contractor shall verify the sufficiency of the size of the shaft openings, clearances in wall cavities and suspended ceilings for proper installation of his conduit's cables, cable trays, panels etc. His failure to communicate insufficiency of any of the above shall constitute his acceptance of sufficiency of the same. The Contractor shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. The exact location and size of all access panels, required for each concealed control damper, valve or other devices requiring attendance, shall be finalized and communicated in sufficient time, to be provided in the normal course of work. Failing this, the Contractor shall make all the necessary repairs and changes at his own expense. Access panel shall be standardized for each piece of equipment / device / accessory and shall be clearly nomenclature / marked.

37. MATERIALS AND EQUIPMENT

All materials and equipment shall conform to the relevant Indian Standards and shall be of the approved make and design. Makes shall be strictly in conformity with list of approved manufacturers attached in these minor components. The Contractor shall be responsible for the safe custody of all materials and shall insure them against theft or damage in handling or storage etc. A list of items of materials and equipment, together with a sample of each shall be submitted to the Owner's site representative within 15 days of the award of the contract.

The quantity of material in the BOQ is indicative. Contractor has to assess the actual requirement of material at site before placing the order, keeping in view the drawing and site requirement from the shortest route. No claim for payment for unused excess material shall be entertained.

38. COMPLETION CERTIFICATE

On completion of the electrical installation a certificate shall be furnished by the Contractor countersigned by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local, state/central govt./ municipal / fire authorities concerned.

39. COMPLETION DRAWINGS

Upon completion of the work and before issuance of certificate of virtual completion the contractor shall submit to the engineer-in-charge four set of layout drawings in progressive manner for individual systems drawn at approved scale indicating the complete wiring system as installed. Drawing shall be prepared on AUTO-CAD (latest version). Along with the hard copies, the contractor shall submit copies of all drawings on CD and one set of all drawings on RTF shall also be submitted. These drawings must provide:

- a. Single line distribution diagram including submain circuit wiring etc.
- b. Location of all DB's, switch board, panels etc.

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

c. Any other relevant drawing.

40. OPERATING INSTRUCTION & MAINTENANCE MANUAL

Upon completion and commissioning of part Electrical system the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound sets of typewritten operating instructions and maintenance manuals. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4-year period of maintenance of each equipment.

41. ON SITE TRAINING

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labour and helpers for operating the entire installation for a period of thirty (30) working days of ten (10) hours each, to enable the engineer-in-charge and his duly authorized representatives to get acquainted with the operation of the system. During this period, the contractor shall train the engineer-in-charge's personnel in the operation, adjustment and maintenance of all equipment installed.

42. MAINTENANCE DURING DEFECTS LIABILITY PERIOD

Complaints

- The Contractor shall receive calls for any and all problems experienced in the operation of the system under this contract, attend to these within 24 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

Repairs

- All equipment that requires repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs concurrently with the defect's liability period, all replacement parts and labour shall be supplied promptly free-of-charge to the engineer-in-charge.

43. METHOD OF MEASUREMENT

The works shall be measured in accordance with relevant IS codes notwithstanding any general or local custom except where otherwise specifically described or prescribed in the contract.

44. DEMONSTRATION TO ENGINEER-IN-CHARGE:

At completion, devices subject to manual operation shall be operated at least five times in presence of engineer-in-charge's site representative to demonstrate satisfactory operation.

45. PREPARATION AND APPROVAL OF DRAWING

On award of the work, the contractor has to prepare working drawings and submit to the Engineer-in-Charge for approval. This drawing shall be prepared after considering all the services, viz. conduits, HVAC ducts, horticulture, plumbing etc. The work is to be executed as per approved drawings.

46. The associate shall attend the inspection of the work by the Engineer-in-Charge as and when required.

47. **The rates quoted shall be inclusive of all taxes and duties, no extra shall be paid on this account.**

48. **INSURANCE AND STORAGE:**

- All consignments are to be duly insured upto the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned

**EXECUTIVE ENGINEER (E)
CPWD, RAIPUR**

COMMERCIAL & TECHNICAL CONDITIONS FOR E&M WORKS
(For Internal & External Work)

1. SCOPE OF WORK:

The specifications given below pertain to the entire electrical and mechanical works to be carried out for **Construction of Office Building & Residential Complex for Subsidiary Intelligence Bureau (SIB) at Mahasamund (C.G.)**. The work shall be carried out as per CPWD General Specifications for Electrical Works, Part-I: Internal, 2023 and Part-II, External-2023, amended up to the last date of submission of tender. The soft copy of this specification is available at the link: http://cpwd.gov.in/Documents/CPWD_Publication.aspx

2. Conformity to IE act, IE Rules, and standards:

All electrical works shall be carried out in accordance with the provisions of Indian Electricity Act, 1910 and Indian Electricity Rules, 1956 amended up to the last date of submission of tender unless specified otherwise. List of rules of particular importance to electrical installations under these General Specifications for internal works is given for reference.

3. General:

3.1 The Department shall not issue any T & P and nothing extra shall be paid on account of this.

3.2 Guarantee & Defect Liability Period

All the equipment shall be guaranteed for a period of 12 months from the date of taking over the installation by the department against unsatisfactory performance and / or break down due to defective design, workmanship of material. The equipment or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-Charge in this regard shall be final.

The tenderer shall guarantee among other things, the following vis-à-vis specifications.

- a) Quality, strength and performance of the materials used.
- b) Satisfactory operation during the maintenance period.
- c) Ceiling fans, Exhaust fans shall be guaranteed for 1(one) Year including lamps.
- d) LED fittings, as a whole including driver shall guaranteed for 5 years.
- e) In case of discontinuation of model and non-availability of spares, the Agency will replace the fittings with equivalent/ high end model in case of manufacturing defect during the warranty period of 5 years.

4. Payments terms:

On account payments for part work (after stipulated and statutory deductions) shall be payable as assessed by the Engineer – in-charge for the items in the Contract. The percentage for wiring items is cumulative of quoted rates

- i) 40% after laying of conduit.
- ii) 80% after drawing of wires and fixing of modular accessories.
- iii) 95% after testing, commissioning.
- iv) 100% after handing over.
- v) **For fittings:** 70% after supply of fittings with duly supported with the proper challan from the authorized dealer.
- vi) 95% after installation, testing, commissioning.
- vii) 100% after handing over.

5. General Conditions

CORRECTION	NIL	INSERTION	NIL		
CUTTING	NIL	OVERWRITING	NIL	AE(E)	EE(C)

- 5.1. The main contractor shall be responsible for coordinating the activities of all works and will ensure progress of works as per laid down programme.
- 5.2. The main contractor and / or his Associated electrical Contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-charge and will comply with the remarks therein.
- 5.3. The contractor shall make his own arrangement at his own cost for electrical / General Tools and plants required for the work.
- 5.4. The connections, inter-connections, earthing and loop earthing shall be done by the contractor her ever required to be done for energization of the installation and nothing extra shall be paid on this account.
- 5.5. The contractor must be able to work on concrete slabs / walls as and when required and in complete coordination with the civil works. Cutting of chases in the plastered wall shall in no case be allowed. The contractor shall fix conduits and boxes in the walls soon after the brick work is completed and finish the chase to rough surface with proper cement sand mixture. Only in exceptional cases e.g. Where cutting of plastered surface cannot be avoided it will be contractor's responsibility to ensure that plastering is done to match the original finish at no extra cost.
- 5.6. The contractor shall remove all the debris due to the electrical works from the site as soon as the work is completed.
- 5.7. The wiring and conduit route shall be marked by the contractor in the drawing first, and shall be got approved from the Engineer-in-charge.
- 5.8. Some light points in lobby / corridors/ stair case/ lift shaft etc. are group controlled which will be measured as per Items mentioned under C-I.
- 5.9. The rupturing capacity of the MCB's shall be 10 KA. The MCB's shall have ISI mark. Quantities of MCBs of different rating of 6 amps to 32 amps shall be brought in consultation with the Engineer-in-Charge, as per loading of circuits.
- 5.10. All the MCCBs shall be rated for Ics=100% Icu
- 5.11. The copper wire to be used on this work shall be FRLS type and ISI marked.
- 5.12. The make of switch boxes shall be the same as that of switches. Only the required knockouts of the switch boxes are to be removed for terminating the conduit pipes with glands / check nuts.
- 5.13. Make of MCB/MCCB shall be the same as the make of MCB DB.
- 5.14. All the switch boxes, MCBDBs are to be covered with plastic sheet / petroleum gelly when installed in brick work till the plastering / painting is done to avoid sticking of cement plaster/ splashes of the paint. Cement plaster / paint is to be cleaned immediately after plaster to avoid rusting of switch boxes and MCB DBs. The plastic sheet is to be removed at the time of handing over.
- 5.15. The Electrical works shall be carried out by the contractor, side by side with the progress of the civil works.
- 5.16. The Contractor shall furnish documentary proof like delivery challans of purchasing Wires, Modular switches & accessories, MCBs, MCBDB, Fittings, accessories and other items from the manufacturers or their authorized dealers to the satisfaction of the Engineer-in-charge.
- 5.17. All GI conduits accessories shall be of the same make as conduits. The Conduits shall be terminated at switch boxes/metallic junction boxes with suitable glands/check nuts.
- 5.18. Cutting of brick walls shall be with chase cutting machine only. All repairs and patch works shall be neatly carried out to match the original finish and to the entire satisfaction of the Engineer in Charge.
- 5.19. All the sub main and circuit wiring includes loose wire for connections inside switch boxes and MCB DBs. No payment for these loose wires shall be made. However, wires within the cubicle panel will be measured and paid under relevant item of work.
- 5.20. All the circuits / sub-main wiring are to be suitably numbered with stickers / marker pen at LT panel, MCBDBs, switch boards (on backside of cover plate) for ease of maintenance. Nothing shall be paid extra on this account.
- 5.21. The contractor shall submit the completion plan separately in triplicate on blue print/ computer plotted with one set on tracing "Cloth" as per Clause-8 of the contract within 30 days of the completion of work. In case, the contractor fails to submit the plan, he shall be liable to pay a sum equivalent to 0.1% of tendered value of the work subject to a ceiling of Rs. 20,000.00.

- 5.22 To facilitate drawing of wires, 18 SWG GI fish wire shall be provided along with laying of recessed conduit for which no extra payment shall be made. Conduits laid for other services, like fire alarm, PA etc., where wiring is not done along with IEI works, fish wire shall be invariably drawn.
- 5.23 The connection between incoming switch / isolator and bus bar shall be made with suitable size of thimble and cable at no extra cost.
- 5.24 Copper conductor of insulated cables of size 1.5 Sq.mm and above shall be stranded and terminals provided with crimped lugs.
- 5.25 All MS junction box cover should be of phenolic laminated / good quality plastic sheet of thickness not less than 3mm and for which nothing extra shall be paid on the account.
- 5.26 All sub-main wiring shall be terminated in the main board with suitable copper lugs and thimbles for which nothing extra will be paid on this account.
- 5.27 All hardware items such as screws, thimbles, GI wire etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned.
- 5.28 All hardware items such as nuts/ bolts/ screws/ washers etc. to be used in work shall be zinc/ cadmium plated iron.
- 5.29 Any conduit which is not be wired by the contractor shall be provided with GI fish wire for wiring by some other agency subsequently. Nothing extra shall be paid for the same.
- 5.30 While laying conduit, suitable size junction boxes shall be provided for pulling the wire as per the decision of the E-in-C.
- 5.31 Materials to be used in work are to be ISI marked. The make of the materials has been indicated in the list of acceptable makes. No other makes will be acceptable. The materials to be used in the work shall be got approved by the Engineer in Charge / his representative before its use at site. The E-in-C shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not acceptable.
- 5.32 Where switches/ sockets/ regulator/ telephone/ TV / internet outlets are to be provided, the same shall be of only one make.
- 5.33 While laying conduits for fire alarm system, sufficient junction outlets are to be provided as per the direction of the Engineer-in-Charge for detectors as required, for which no extra payment shall be made.
- 5.34 Wherever light fittings are proposed to be provided on the false ceiling, the respective light / fan point wiring will have to be brought up to the terminal of the light fittings / fans by the contractor. Flexible metal conduits shall be used for drawing wires from steel conduits on ceiling to fittings on false ceiling and nothing extra shall be paid to the contractor for the same.
- 5.35 In case the same item appears more than once in the schedule of work under the same sub head or among the different subhead of works, the lowest rate quoted for that item shall be taken for other items also.
- 5.36 The modular size of boxes for point wiring is to be increased by 2 modules for accommodating fan regulator wherever required. Nothing extra shall be paid for this increase in size.
- 5.37 The main agency has to submit a security deposit towards warrantee of 5 years for LED fittings of 5% of the rates quoted by him for LED fittings in acceptable form (FDR/DD/BG) with **EE(E), Raipur** before expiry of defect liability period of one year, otherwise, the same will be deducted from the Security Deposit for the whole work before releasing the same. This Security Deposit against LED fittings will be released after expiry of 5 years of warrantee period.

ANNEXURE – X**UNDERTAKING LETTER FROM MANUFACTURERS OF LED FITTINGS****We hereby agree that**

1. All the LED fittings supplied by us are guaranteed for five years including drivers from the date of handing over.
2. In case of discontinuation of model and non-availability of spares, we will replace the fittings with equivalent/ high end model in case of manufacturing defect during the warranty period of 5 years.

For M/S,

.....

(Authorized signatory of manufacturer of LED luminaire)

Counter Signature,

Major contractor

LIST OF PREFERRED MAKES

The following Makes of material are preferred for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any Make stated below does not comply with the technical specification given in the tender then such a Make will not be acceptable.

SUB WORK-I: INTERNAL ELECTRIFICATION AND STREET LIGHT

S.No	Description	Makes
1.	FRLS Copper Conductor PVC Insulated Wires	AKG / Havells/Polycab/Banton Cable/ KEI
2.	Steel / MS Conduit and accessoires(ISI marked)	BEC / NIC / AKG/ Steel Kraft/ RMCON
3.	PVC Conduit and accessoires (ISI marked)	BEC / AKG/ Precision / Polycab
4.	GI Pipe/ MS Pipe (ISI marked)	TATA / Jindal (Hissar) / Sail
5.	Modular type switch, socket & Boxes, plate & Accessories	Legrand(Myrus)/Honeywell(ORNA)/Schneider(Unica Pure)/ Havells(Morano)/
6.	Lugs and Gland	Commet/Dowells/Jainson/ HAX/3M
7.	ELCB/ RCCB /MCB DB / MCB'S	Legrand(Ekinox3)/Siemens(Betgaard) /Lauritz Knudsen(AU)/ Schneider (Acti9)
8.	MCCB (Ics=100%Icu)	Legrand(DPX3)/Siemens(3VA)/Lauritz Knudsen (D Sine)/ Schneider(NSX)
9.	Industrial Sockets & Plugs	Legrand / Siemens /Lauritz Knudsen / Schneider/ ABB
10.	DWC/ HDPE Pipe	Rex / Duraline/ Dutron/Jain/Ketron/ Sintex/
11.	Cable Junction Box	Sintex/ Rex / Duraline/ Dutron/Jain/Ketron
12.	XLPE /PVC Insulated PVC SheatedArmoured /Unarmoured / Aluminum / Copper Conductor/ UG Cable of 1.1 KV Grade.	AKG / Havell / Polycab / Bonton Cable/ KEI
13.	LT Power cable	AKG / Havell / Polycab / Bonton Cable/ KEI
14.	Selector Switch, Toggle switch	Salzer (Lauritz Knudsen) / Kaycee /Selec Control
15.	Cable Trays (Factory Fabricated) / Raceways	MK / OBO/ Legrand/ Slotco/ Steel Kraft
16.	Occupancy Sensor	Philips / Wipro / Legrand/Dynalite/Lutron/ Zumtobel/Havells
17.	Rising mains	Legrand / Siemens / LK(Lauritz Knudsen)/ Schneider
18.	Signage, Exit light, Evacuation plan	Prolite / Autoglow/ Signsutra/ ACE Signs
19.	Timer switch	Legrand / Siemens /Lauritz Knudsen / Schneider
20.	CPVC Pipe	Ashirvad/ Supreme/ Finolex/ ASTRAL/Apollo
21.	LED fittings and accessories	Make: Phillips/ Wipro/ Havells/ Jaquar
22.	1200 mm/1400 mm ceiling fan BEE Star (BLDC)	Havells / Usha/ Atomberg / Bajaj/ Orient/ Crompton
23.	Fresh Air / Exhaust Fan	Havells / Usha / Bajaj/ Orient/ Crompton
24.	400mm Sweep Wall Fan	Havells / Usha/ Atomberg / Bajaj/ Orient/Crompton

CORRECTION NIL INSERTION NILCUTTING NIL OVERWRITING NIL AE(E) EE(C)

S.No	Description	Makes
25.	Fire Signage/ Exit light /Evaluation plan	Prolite/ Auto glow/ Safety Signs And Equipments/ ASES Security
26.	Hot dip Galvanized Octagonal pole & bracket	RR Ispat/ Bajaj /Transrail/Volmont/ B.P. Project Pvt.Ltd
27.	ABC type Fire Extinguisher (6 Kg)	Padmani/ Lifeguard/ Fireshield /Ceasefire/ Atasee
28.	Air Conditioning System	Daikin/LG/O-General/Mitsubishi
29.	Water Cooler	Voltas/Bule Star/Usha
30.	Water Purifier	Aquaguard/Kent/Pureit

SH -VI (LT PANEL AND FEEDER PILLAR)**6.M.V. PANALS & FEEDER PILLERS.**

- 6.4 The M.V. panels & feeder pillars shall be suitable for operation on 415/433 V, 3 phase 50 Hz 4 wire AC supply system. The MV panel shall be factory made, manufactured by CPRI approved (Registered) firm.
- 6.5 The M.V panels & feeder pillars shall be comprised of switch gears in the form of ACB's & MCCB's as mentioned in the relevant nomenclature of the item of work. The M.V. panel shall be suitable for indoor type installation having incoming & outgoing mountings in sectionalization manner. The design of M.V. panel shall be of cubical type and the degree of enclosure protection shall be of I.P. 42 as per IS 13947 (Part-1).
- 6.6 The M.V. panel shall be of floor mounted free standing totally enclosed & extensible type. The M.V. panel shall be vermin proof and shall be suitable for the local climatic conditions. The design shall include all provisions for safety of operating and maintenance personnel. The general construction of MV panels shall confirm to IS: 8623 / 1993 for factory assembled.
- 6.7 The cubical type M.V. panel shall be fabricated out of sheet steel not less than 2.0 mm thick. Wherever necessary, such sheet steel members shall be stiffened by angle iron frame work. General construction shall employ the principle of compartmentalization and segregation for each switch gears. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall be mixed with sections required for feeders. Each section of the rear accessible type board shall have hinged access door at the rear. Over all height of the board shall be not more than 2.4 Mtr. The operating handle for highest unit shall not be at the height more than 1.7 Mtrs. The general arrangement for multi-tier construction shall be such that the horizontal tiers formed pleasant and aesthetic look. The general arrangement drawing of MV panel shall be got approved from Engineer-in-charge of work before the fabrication is taken up. The cable entries for various feeders shall be either from top or bottom. Through cable alleys located in between two circuit section, either in the rear or in the front of the panel. All cable termination shall be through gland plates. There shall be separate gland plate for each cable entry so that there will not be dislocation of already wired circuit when new feeders are added. Cable entry plates shall therefore be sectionalized. The construction shall include necessary cable supports for clamping the cable in the cable alley or rear cable chamber. Cubical panel BUS shall be made of tested structural modular section.
- 6.8 The bus bar shall be of aluminium/ copper (as per BOQ) of high conductivity electrolytic quality and of adequate section. Current density shall not exceed 160 amps/sq.cm for Copper and 130 amps/ sq.cm for aluminium. The bus bar system may comprise of a system of main horizontal bus bars and ancillary vertical bus bars run in bus bar alleys on either side of which the circuit could be arranged with front access cable entries. In the case of rear access, horizontal bus system shall run suitably either at the top or bottom. All connections to individual circuits from the bus bar shall preferably be solid connections; however flexible connections shall also be permitted as per recommendations of the Panel Manufacturer. All bus bars and connections shall be suitably sleeved / insulated in approved manner.
- 6.9 Incomer termination shall be suitable for receiving bus underground cables. Cable terminations shall invariably be through terminal blocks (Polyamide or superior) or brought out solid terminals.
- 6.10 All voltmeters and ammeters shall be flush mounted of size minimum 96 mm conforming to class 1.5 of IS : 1248 for accuracy. All voltmeters shall be protected with MCB.
- 6.11 On all incomers of M.V. panels, ON/OFF indicating LED lamps shall be provided and shall be suitable for operation on AC supply. Phase indicating LED lamps shall be associated with

necessary ON/OFF toggle switch.

- 6.12 All small wiring for controls, Indication etc. shall be of with suitable FRLS/ HFFR (halogen free fire retardant) copper conductor cables. Wiring shall be suitably protected within switch board. Runs of wires shall be neatly bunched, suitably supported and clamped. Means shall be provided for easy identified of the wires. Where wires are drawn through steel conduits, the work shall conform to CPWD General Specifications for Electrical works (Part I- Internal) – 2023 and IS: 732 as the case may be. Identification ferrules shall be used at both ends of the wires. All control wiring for external connections is to be brought out of terminal board.

6.13 OPERATIONAL REQUIREMENTS

The indoor type MV panel shall conform to the followings: -

- The panel shall comprise of incomers, outgoing feeders and bus coupler as specified. The incomer shall be either an air Circuit Breaker or MCCB. The outgoing feeders shall be MCCBs.
- Bus bar for phase and neutral shall have a rating as specified in the BOQ.
- The entire switch panel shall be cubical type generally conforming to IS: 8623/1993 for factory assembled switch board.
- The incomer panel shall be suitable for receiving MV cable of size specified either from top or from bottom.
- All incoming AIRCIRCUIT BREAKER/MCCB shall have suitable adjustable tripping current and the time delay settings.
- The entire panel shall have a common earth bar of size as specified with two Terminals for earth connections.

6.14 INSTALLATION

The installation work shall cover assembly of various sections of panels lining up, grouting the units etc. in the case of multiple panel switch boards after connecting up the bus bars etc., all joints shall be insulated with necessary insulation tape or approved insulation compound. A common earth bar as per section 7 of these specifications shall be run inside at the back of switch panel connecting all the sections for connection to frame earth system. All protection and other small wirings for indication etc. shall be completed before calibration and commissioning checks are commenced. All relays, meters etc. shall be mounted and connected with appropriate wiring.

6.15 TESTING AND COMMISSIONING

Commissioning checks and tests shall include all wiring checks and checking up of connections. Relay adjustment/setting shall be done before commissioning in addition to routine Megger tests. Checks and tests shall include the followings: -

- Operation checks and lubrication of all moving parts
- Interlock function checks.
- Continuity checks of wiring, fuses etc. as required.
- Insulation test: When measured with 500V meger the insulation resistance shall not be less than 100 mega ohms.
- Trip tests and protections gear test.

6.16 MOULDED CASE CIRCUIT BREAKERS

- The MCCBs shall comprise single units of triple/four pole construction as specified in item.
- Variable thermal setting shall be provided in all MCCBs with thermal magnetic release.
- MCCBs shall be provided with the following features in microprocessor release:
 - Inverse-time-current tripping characteristics under sustained overload.
 - Instantaneous tripping on short circuit.

- d. MCCBs shall be of current limiting type.
- e. MCCBs must have its rated service breaking capacity (Ics) not less than 100 % of its specified fault level i.e. Icu.

6.18 **INDICATING INSTRUMENTS AND METERS**

Digital electrical indicating instruments shall be of minimum 96 mm square size and with a class of accuracy of 1.0, should have approved colour readout.

6.19 **CABLE TERMINATIONS**

Suitable double compression type, brass cable glands with check nuts, rubber sealing ring and brass washers mounted on a removable gland plate shall be provided to support all cables entering the switchgear. Cable Termination will be measured under separate item in the schedule of quantities.

6.20 **LABELS**

Labels shall be provided for Feeder designation with feeder equipment no, compartment designation, panel designation main label. All labels shall comprise white letters on a black background and shall be made of non-rusting metal or 3-ply lamicaid or engraved PVC. Size of lettering shall not be less than 6.0 mm.

6.21 **EARTHING**

Earth bus-bars shall be supported at suitable intervals. All non-current carrying metal and hinged doors shall be earthed to the earth bar.

6.22 **440 VOLTS GRADE WARNING BOARDS**

440 Volts grade warning boards of appropriate size shall be fixed at prominent places. These shall have minimum 3 languages inscribed in it, mainly Hindi, English and local language shall be vitreous enameled type. The Warning boards shall also have the usual electrical shock inscriptions as well as the mark of Danger on it. These shall be fixed in places as per direction of Engineer in Charge and of appropriate voltages.

- 6.23 Shop Drawings for IEI and Co-ordinated Drawings including all other E & M services shall be prepared by the contractor and got approved by Engineer-in-Charge prior to execution of work.

Package- VIII**SUB STATION**
LIST OF APPROVED MAKES

The following makes of materials are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any make stated below does not comply with the technical specification given in the tender then such a make will not be acceptable.

S.No	Description	Makes
1.	LT Power cable	AKG/Havells/Polycab / Bonton Cable/KEI
2.	HT Power cable	AKG/Havells/ Polycab / Bonton Cable/KEI
3.	LT/ M.V. Panels/ APFC Panel	Advance Panel and Switchgear Pvt. Ltd. Haridwar/ Tricolite Electrical Industries Pvt. Ltd., Ghaziabad/ Adlec Systems Pvt. Ltd. Mundka Delhi/ Power and instrumentation Guj. Ltd, Ahmedabad/ ABAK Electrofab Engineering, Navi Mumbai/ Vidyut control automation Pvt. Ltd., Pune/ Marine Electrical, Goa / VIVID Electromech Pvt. Ltd., Mumbai/ C&S/ Milestone switchgear Pvt. Ltd/ Neptune/ Siemens/Application Controls Pvt. Ltd./Pristine/ R.R. Ispat / SPC Electrotech Pvt. Ltd. (manufacturer should have minimum 7-year Experience with valid CPRI Certificate)
4.	ELCB/ RCCB /MCB DB / MCB'S	Legrand(Ekinox3)/Siemens(Betgaurd) /Lauritz Knudsen(AU)/ Schneider (Acti9)
5.	MCCB (Ics=100%Icu)	Legrand(DPX3)/Siemens(3VA)/Lauritz Knudsen (D Sine)/ Schneider(NSX)
6.	Digital Meters	LK/ Schneider/ABB/Siemens
7.	Current Transformers & Potential Transformer	Automatic Electric/ Kappa/ LK / Neptune
8.	Digital indicating / Measuring Instruments/ Multifunction Meters/ CT	LK / Schneider/ AE/ ABB/ Bentac
9.	Selector Switch	LK / Kaycee/ Siemens / ABB
10.	Indication Lamp & Push Button	BCH / L&T / Siemens / Schneider / ABB
11.	Digital Energy Meter	LK / Conzerv / Secure / ABB / AE
12.	APFC Relays	LK / Siemens / Schneider / Neptune (Ducati)
13.	Bus Trunking, Rising Main & Tap- Off Box	Legrand / L&K/ Schneider / Siemens
14.	Capacitor(ISI marked)	EPCOS/ Neptune/ Siemens/ L&K /Schneider
15.	Cable Gland/ Lugs/ Thimbles	Commet / Dowells/ Raychem/ Gripwell / Jainsan
16.	Relays	Areva / Seimens / Procom / Legrand/ Selec Control
17.	Heat Shrinkable HT Cable End Termination	Denson/ Raychem / Capseal/3M

Sub Head- XII: LIFT

The work shall be carried out as per General Specifications for Electrical Works (Part-III- LITS & Escalators) - 2003. The soft copy of this specification is available at the link: <http://cpwd.gov.in/Publication>.

The eligibility criteria of Lift work shall be as per DG OM No. DG/SE (E) TAS/PPP-MII/22(H) date 28/09/2020.

ELIGIBILITY CRITERIA FOR LIFT WORKS (REVISION-3)

1. The lift manufacturer shall comply with BIS standards, duly certified by the manufacturer itself.
2. The manufacturer shall be compliant to the Public Procurement (Preference to Make in India), Order 2017 (as amended from time to time) issued by the department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry.
3. The experience of successful completion of similar works shall be as per CPWD works Manual/SOP.
4. The manufacturer shall furnish an undertaking regarding availability of spares for the entire expected lift of the lift i.e. 15 to 20 years.
5. The complete lift installation including its components, safety devices, various types of controls etc., testing, inspection, operation & maintenance shall conform to relevant codes, standards, code of practices, guidelines, safety rules, inspection manual(s), rules issued by Bureau of Indian Standards, as amended up to the last date of receipt of tenders.
6. Quality standards shall conform to latest IS/ISO-9001:2015.
7. The down time of installed lifts being maintained by the manufacturer shall not be more than 8 hours(average) in case of minor faults and 7 days (average) in case of major faults during the last one financial year.

12.1 Works to be done by the contractor

In addition to the manufacture, supply, installation, testing and commissioning of the lift including all auxiliary equipment, following works shall be deemed to be included within the scope of the work to be done by the contractor.

- 12.1.1. All minor building work necessary for installation of equipment such as making of openings in wall/floor either of RCC or brick masonry etc., and restoring them to original Condition and finish. The scope of minor building work includes all grouting of foundation concrete pads to be formed or made as base for supporting R.S. joists etc., grouting and anchoring of all boards clamps, supports, foundation bolts, installation in position of R.S joists in the machine room, lift well or in the pit, such works shall exclude cutting of marble work and construction of partition wall wherever involved.
- 12.1.2. Supply of necessary R.S. joists or angle iron supports brackets etc., for installation of the lift, either in the machine room or at other places as may be necessary including their installation in position.
- 12.1.3. All electrical works except bringing in main connection and earth connection to the machine room terminated on suitable switch fuse unit/ board. All electrical works including inter-connection from this switch/ board and loop earthing from the earth bar to be provided in the machine room shall be done by the successful contractor.
- 12.1.4. Responsibility to ensure safety of lift materials against pilferage and damage till the installation is handed over to the consignee.
- 12.1.5. All scaffolding as may be necessary in the lift well during erection work and subsequently removed.
- 12.1.6. Temporary barricades with caution boards at each landing to prevent accident during execution
- 12.1.7. Supply and installation of landing facia plates made of steel, car apron plates, sill support angles my clamps, foundation bolts support etc., as are necessary in connection with the of the lift.

CORRECTION	NIL	INSERTION	NIL		
CUTTING	NIL	OVERWRITING	NIL	AE(E)	EE(C)

- 12.1.8. Steel ladder to be provided for access to lift pit wherever required under regulations.
- 12.1.9. The Successful contractor shall coordinate lift installation work with other contractor/ agencies engaged in construction of building if any and exchange freely all technical information so as to make execution of works, contract smooth.
- 12.1.10. The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning, as may be required by the department. The term complete installation shall not only mean major items of the plant and equipment covered by specifications by all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts whether or not those have been mentioned in details in the tender document in connection with this contract as this is a turnkey job.
- 12.1.11. Maintenance (Routine & preventive) for One year from date of completion and handing over.
- 12.1.12. The work is turn key project. Any item required for completion of the project but left inadvertently shall be executed with-in the quoted rates.
- 12.1.13. Provision of supports/clamps for equipment etc. wherever required.
- 12.1.14. Tools and tackles required for handling and installation.
- 12.1.15. Necessary testing equipment for commissioning.
- 12.1.16. Watch and ward of materials and/or installation and equipment till their handing over to the department.

12.2 Completeness of tender

- 12.2.1 All fittings, equipment's, units, assemblies and accessories, hardware, foundation bolts, terminal lugs for electrical connections, cable glands, junction box and items which are useful and necessary for efficient assembly in operation and installation shall be deemed to have been included in the scope of work. The installation shall be complete in all details whether such details have been mentioned in the specifications or not.

12.3 Information to be supplied by contractor after award of work

- 12.3.1 Within a period of 4 weeks from the date of receipt of letter of acceptance the contractor shall provide the department his programme bar chart for submission of preliminary drawing, manufacturing of equipment's, Installation Testing & commissioning and handing over, This Should be Corelated With the building completion programme. The contractor shall be required to submit in triplicate the following drawings and Information within the above 4 weeks period for approval of the department before commencing the work
- All general arrangement drawings;
 - Details of foundations for equipment, load data location etc. of various assembled equipment as may be needed generally by other agencies for purpose of their work. The data will include breaking load on guides, reaction of buffers on lift pits, reaction on support points in machine room, lift well etc.
 - Complete layout dimensions for every unit/ group of units with dimensions required for erection purposes.
 - Any other drawing/ information not specifically mentioned above but deemed to be necessary for the job by the contractor.
 - List of items to be carried out by the department in accordance with the tender accepted.

12.4 Commencement of work

- 12.4.1 As soon as the General arrangement drawings are approved, the contractor should commence work. The contractor shall also send seven sets of final drawings to the department who shall return one copy.
- 12.5 Liaisoning for erection permit and subsequently working permit from Local authority of Lift and Escalator will be responsibility of the contractor. Also, for lift Inspection report from local authority will be responsibility of the firm.

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

12.6. COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS

12.6.1 All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by these specifications. In particular, the equipment and installation will comply with the following:

- i) Factories Act.
- ii) Indian Electricity Rules.
- iii) I.S. & BS Standards as applicable.
- iv) Workman's compensation Act.
- v) Statutory norms prescribed by local bodies like CEA, NDMC etc.

Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

12.7 Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirements would make the tenderer liable for penalty of Rs. 50/- for each default. In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

12.8 Conformity with statutory Acts, Rules, regulations, Standards and Safety Codes:

12.8.1 The installation shall be carried out in conformity with the local lifts Act and Rules. For example, the Bombay lifts Act of Bombay, the West Bengal lifts and Escalators Act for West Bengal, the Bombay lifts Act as extended to Delhi for Delhi etc. At other places where no local lifts Act is in force the Bombay lift Act shall be followed. The installation shall also conform to requirements of local Municipal Bylaws. Extracts of Bombay lift Act and Rules as applicable for Delhi are appended at Appendix 'IV'

12.9 Fire regulations:

12.9.1 The installation shall be carried out in conformity with the local fire regulations and rules there under wherever they are in force.

12.10 ERECTION TOOLS:

12.10.1 No tools and tackles either for unloading or for shifting the equipment for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

12.11 INSURANCE AND STORAGE

12.11.1 All consignments are to be duly insured up to the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

12.12 VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION:

12.12.1 The contractor shall have to produce all the relevant records to certify that the genuine equipment from the manufacturers has been supplied and erected.

12.13 INSPECTION AND TESTING

12.13.1 Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturers premises shall be furnished to the Engineer-in-charge and consignee.

12.13.2 After completion of the work in all respect the contractor shall offer the installation for testing and operation.

12.14 TESTING OF LIFT INSTALLATION:

12.14.1 Testing of lift installation shall be carried out as per section IV (Testing of Lift Installations) of specification.

12.15 TRAINING

12.15.1 The scope of works includes the on job technical training of two persons of Department at site. Nothing extra shall be payable on this account.

12.16 INDEMNITY

12.16.1 The successful tenderer shall at all times indemnify the department, consequent upon this works contract. The successful tenderer shall be liable, in accordance with the Indian Law and Regulation for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising there from on the department during the period of erection, construction and putting into operation the equipment and ancillary equipment under the supervision of the successful tenderer in so far as the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk, no extra payment would be made to the successful tenderer on account of the above.

12.17 MAINTENANCE:

12.17.1 Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of one year from the handing over of the installation.

12.17.2 The maintenance, routine as well as preventive, for one year from the date of taking over the installation as per manufacturers recommendation shall be carried and the record of the same shall have to be maintained.

12.18. ALL INCLUSIVE MAINTENANCE PERIOD**A. Routine Preventive Maintenance Schedule to be submitted**

- i. Schedule to cover manufacturer's recommendation and/or common engineering practice (for all plant and machinery under contract).
- ii. Plant and machinery history card giving full details of equipment and frequency of checks and overhaul.
- iii. Monthly status report.

B. Uptime during maintenance period

- i. 98% uptime of all systems.
- ii. Uptime shall be assessed every month and in case of shortfall during any month the contract shall be extended by a month.
- iii. Break-downs shall be attended to within two hours of reporting.

C. Shut Downs

- i. Routine shut downs shall be permitted only with prior permission.
- ii. Contractor shall be at liberty to carry out routine maintenance as and when required but with prior permission of the Owner.

12.19 Payment Terms

12.19.1 No advance payment shall be made.

12.19.2 On account payments for part work (after stipulated and statutory deductions) as assessed by the Engineer – in-charge for the applicable items in the Contract shall be payable at part rates not exceeding the percentage indicated against the stages of work.

12.19.3 Stage of Work % of rates payable

- a) Delivery at site in good condition after initial inspection (Wherever specified) on pro-rata basis for Lift 70 %
- b) On completion of Pro-rata installation, testing and commissioning. 20%
- c) The final payment shall be made after Completion of the installations to the entire satisfaction of the Engineer-in-Charge, approval from local bodies and handing over the site/ installation to the Department in good working condition 10 %.

LIST OF APPROVED MAKES

The following Makes of materials are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any Make stated below does not comply with the technical specification given in the tender then such a Make will not be acceptable.

S. No.	Description	Makes
1.	Make of lifts	1. Otis Elevator Company India Limited
		2. KONE Elevator India Private Limited
		3. Mitsubishi Elevator India Limited
		4. Schindler Elevator Corporation
		5. Johnson Pvt. Ltd.
		Note: The above firm should complying the criteria of OM No. DG/SE(E). (TAS)/PPP/MII order / 22 date 28.09.2020

Sub Head- XIV: DG SET

The work shall be carried out as per CPWD General Specifications for Electrical Works Part VII D.G. Sets - 2013. The soft copy of this specification is available at the link:

http://cpwd.gov.in/Documents/CPWD_Publication.aspx

13.1 General

The successful bidder/ associated agency shall submit the following undertaking from OEM/OEA before placing the order.

- i) Written commitment from OEM/OEA to supply the DG Sets and delivery schedule as per the requirement of department.
- ii) Certificate from OEM/OEA or authorized service provider of engine manufacturer for satisfactory installation and commissioning of DG Set after completion of the work.
- iii) Required Guarantee of DG Set from OEM/OEA in favor of Engineer in charge to cover defect liabilities.
- iv) An undertaking that mandatory free service shall be carried out during the guarantee period by the authorized service provider of engine manufacturer.

13.2 Works to Be Done by the Contractor

- (I) POL i.e. HSD oil and lub. oil for diesel engine for testing & commissioning for 12 hours i/c 1hr of 10% overloading at OEA/ OEM works shall be arranged by the contractor. POL i.e. HSD oil and lub. oil for trial run of 4 Hrs. at site at available load shall be also arranged by the tenderer. The Tenderer has to fill up the DG sets fuel tank to its full capacity with HSD oil post site testing of 4hours.
- (II) Painting of all exposed metal surfaces of equipments and components with appropriate colour.
- (III) Clearance/ Approval of the complete installation from CPCB-IV / State Pollution Control Board, Central Electricity Authority (CEA)/ Local Bodies and other licensing authorities, wherever required. However, application shall be made by Department and any statutory fee, as applicable, shall be paid by Department directly to the Govt. authorities concerned.
- (IV) The tenderer has to arrange electrical load for testing of DG Set for 12 Hours i/c 10% over load for 1 hour as required at the factory.
- (V) The successful tenderer has to test & commission the DG Set in presence of company service engineer.

13.3 DG set will be tested on load of unity power factor for the rated KW rating. During testing each of the D.G. sets covered under scope of work, shall be operated for a period of 12 hours on the rated KW at DG set's KW rating including one hour on 10% overload after continuous run of the 12 Hours. During testing all controls/ operations safeties will be checked and proper record will be maintained. Any defect/ abnormality noticed during testing shall be rectified. The testing will be declared successful only when no abnormality/ failure is noticed during the testing. The DG set will be cleared for dispatch to site only when the testing is declared successful by authorized representative/ Engineer-in-Charge.

13.3.1 Actual fuel consumption visa-vis committed value of fuel consumption of the engine will also be monitored and same should be in-line with data submitted.

13.4 Running in Period & Date of Acceptance

After successful testing of the DG set, a trial run at available load will be carried out for 120 Hours or 15 days whichever is earlier. The DG set will be operated and a log of all relevant parameters during this period. The arrangement of staff for trial run / running in period will be made by the successful tenderer. However, diesel shall be provided by Department. The contractor will be free to carry out necessary adjustments. The DG set will be said to have successfully completed the trial run, if no break down or abnormal / unsatisfactory operation of any component of the entire installation included in the scope of work of the contract, occurs during this period. After this the DG set will be made available for beneficial use. After the DG set has operated without any major break down / trouble, it shall be taken over by the department subject to guarantee clause of this contract. This date of taking over of the DG set, after trouble free operation during the trial run / running – in period, shall be the date of acceptance / taking over.

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

13.5 After Sales – Service:

The contractor shall ensure adequate and prompt after sales service free of cost during guarantee period, and against payment after the guarantee period is over, in the form of maintenance, spares and personnel as and when required during normal life span of the equipment's and shall minimize the breakdown period. In case of equipment supplied by other manufactures the firm shall furnish a guarantee from the manufacture for the same before the DG Set installation is taken over.

13.6 Payment Terms

13.6.1 No advance payment shall be made.

13.6.2 On account payments for part work (after stipulated and statutory deductions) as assessed by the Engineer – in-charge for the applicable items in the Contract shall be payable at part rates not exceeding the percentage indicated against the stages of work.

13.6.3 Stage of Work % of rates payable

- a) Delivery at site in good condition after initial inspection (Wherever specified) on pro-rata basis for DG Set, AMF Panel & Essential Panel75 %
- b) Delivery at site in good condition after initial inspection (Wherever specified) on pro-rata basis for all other items70%
- c) On completion of Pro-rata installation (For 'a') 15%
- d) On completion of Pro-rata installation (For 'b')20%
- e) The final payment shall be made after Completion, testing & commissioning of the installations to the entire satisfaction of the Engineer-in-Charge, approval from local bodies and handing over the site/ installation to the Department in good working condition10%.
- f) For other items, the part rates will be decided by the Engineer-In-Charge of the work and shall be binding on the Contractor. The Sub-Standard work if any, shall not be accepted & measured unless approved by the competent authority.

Sub Head-XIV: DG SET**LIST OF APPROVED MAKES**

The following Makes of materials are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any Make stated below does not comply with the technical specification given in the tender then such a Make will not be acceptable.

S.No	Description	Makes
1	Diesel Engine	Kirloskar/ Ashok Leyland/ Cummins / Perkins / Caterpillar /Mitsubishi
2	Alternator	Crompton/ Stamford/ Leroy Somer/ Jyoti
3	AMF / Synchronization panel	OEA of DG SETs
4	Structural Steel	As per Part-B
5	PLC	Seimen/ Cummins/ Mitsubishi/ Allen Bradly
6	Battery	Exide/ Amaraja/ Lumminus/ National Panasonic/ Amar Raja/Amaron
7	Other items	As per Sub Work-I

Sub Head-XIII: IP Based EPABX, CCTV & LAN System

The work shall be carried out as per CPWD General Specifications for Electrical Works, Part-I: Internal 2023, The soft copy of this specification is available at the link: http://cpwd.gov.in/Documents/CPWD_Publication.aspx

Shop Drawings for CCTV, LAN, Networking shall be prepared by the contractor and got approved by Engineer-in-Charge prior to execution of work.

SCOPE OF WORK

The scope of this specification cover works of design, Supplying, installation, testing and commissioning of CCTV System, LAN Networking

- 1) The work under this system shall consist of design, supply, installation, testing, training & handing over of all materials, equipment's and appliances and labor necessary to commission the said system. The IP based HD CCTV system is designed for continuous surveillance and monitoring of **SIB Mahasamund**. the cameras are chosen as to work in outdoor environment and Indoor environment in low light conditions. All the data is stored in one devise from where it is given to various workstation for monitoring and display, the device will be housed inside a secure server rack. It has facility for live monitoring, storing of data, search from past etc. All the cabling work is to be done in CAT 6A with POE switches for powering the camera and data transmission. The power to the cameras will be given from POE network switches. The switches will be mounted inside rack
- 2) This proposal specifies the requirement for establishment of wired data network. the access switches shall be installed in network rack on the floors wherever the requirement in there. The structure cable for each floor will be done from rack.
- 3) **OEM Authorization for participating in the tender must be submitted along with the proposal, failure in which will be rejected. Also Letter from Manufacturer for supporting the system shall be submitted by the vendor during bid submission.**

4) **SYSTEM DESIGN AND ARCHITECTURE:**

CCTV system should be designed such as to cover the strategic locations and sensitive areas of High-end cameras with Night sense feature to be installed for this outdoor application. All outdoor speed domes shall be rugged and shall be weather proof as per specifications. Also, the systems should utilize only industry standard protocol.

General positioning of the cameras are in the entrance security area, receptions, all the lift lobbies, inside the elevators, all patient & standby waiting areas, corridors, all exits, lobbies, and Laboratory areas can be monitored.

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

ADDITIONAL TERM AND CONDITION

1. The successful tenderer would be required to submit the following drawings after award of work for approval before commencement of installation. Cost of these drawing deemed to be included in the rates and nothing extra shall be paid on this account.
 - a. All general arrangement drawings.
 - b. Details of the equipment/ component hardware, software's, single line diagram, installation drawings, i/c mounting/hanging arrangement, electrical load requirements, copy of standards and compliance standards, data, power and communication cables, location details etc. of various assembled equipment as may be needed generally by other agencies for purpose of their work
 - c. Complete layout dimensions with location of equipment for every unit/group of units with dimensions required for erection purposes.
2. Any other drawing/information not specifically mentioned above but deemed to be necessary for the job.
3. As per approved drawing and BOQ technical data of all component shall be approved from engineer-in-charge.
4. The contractor shall submit the relevant test certificate from OEM at the time of supply of equipment.

Services under this project include:

- 1) General requirements for Cabling Work
- 2) Ferruling and Labeling Requirements
- 3) Structured Cabling Documentation
- 4) Active Network Devices Related Configuration Work
- 5) Active Device Configuration Related Testing Work
- 6) Active Device Configuration Related Physical Installation Work

UTP Cabling Work Related General Requirements

Structured cabling standards shall be strictly followed.

- [1] **Cat 6/Cat 6A UTP cable installation:** Cat 6/Cat 6A UTP cables shall be installed inside conduit as per CPWD specification so that it is not exposed anywhere. Velcro cable ties provisioned by the contractor shall be used for keeping cables bundled.
- [2] **IO Box installation:** Complete IO box assembly shall be installed
- [3] **Racks installation:** Racks with necessary accessories like cable managers, patch panels, fans, power strips etc. Shall be installed.
- [4] **UTP cable termination:** Standards based termination of UTP cables at both ends—patch panel and RJ45 jack of IO outlets. Use of Patch Cords to connect the patch panel and then network/fiber switch
- [5] **Laminated Printed IDs for cables and IO boxes**
- [6] **Penta scan test reports for Cat 6/Cat 6A nodes will be submitted.**
- [7] Any additional materials/ equipment if needed for the above installations shall be supplied by the contractor.

Ferruling and Labelling Requirements

- [1] Lettering and numbering shall be black, longitudinal to cables, shall be type din readable format, permanent and smudge-proof. Cable labels shall have a white background unless specified elsewhere in this specification. Labels shall have waterproof jackets. Hand-written labels will only be acceptable on a temporary basis during installation.
- [2] Labels at the communication rack or cabinet should identify the location, e.g., room number of workplace outlet and to cable number. Labels at workplace outlet should identify the communication cabinet and cable number.
- [3] Fibre cables should be labelled at each end with a unique circuit number. The fibre termination

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

panel must also be labelled with the circuit number at both ends.

Structured Cabling Documentation

The installer must prepare diagrams showing the locations and layout of the concentration points and the routes taken by the trunking and up link cables. These diagrams should be submitted in electronic Auto CAD format, and on paper. These diagrams should include floor plans, including room numbers of the buildings, with additional layers containing both data and fiber cable routes. They should also contain the cable numbers in relation to room numbers. In addition to the test results for the premises cables, the installer should submit a document identifying the relationship between each cable number used in the installation and the corresponding patch panel numbers and workplace outlet room numbers. It should be trivial to correlate the cable numbers used in this document with the individual cable test results. This document should be submitted in electronic, Excel, format. A hard copy shall be provided by the contractor. Each data point marked on a drawing will individually indicate the port/wire number (at the actual label) in close proximity without being obscured by other information.

Active Devices Related

- [1] All active devices shall be installed using necessary accessories and configured to meet network specifications.
- [2] Any necessary software would also be installed and configured in this stage.

OEM Eligibility Criteria

S. No.	Eligibility Criteria
1	OEM Should be registered in INDIA.
2	All Cat6/ Cat 6A cable and component of CCTV and LAN should be from single OEM.
3	OEM must be EIA/TIA Committee Member.
4	Data Sheets of all proposed products should be available on the OEM public website. The data sheets provided on the OEM public website and submitted data sheets should be the same.
5	The OEM products when installed should carry and provide 10 years of end-to-end channel performance warranty.
	Eligibility Criteria of OEM for VC System
6	All the Product/Component shall be same OEM for better integration
7	The OEM shall have adequate technical support presence in the State of project implementation or nearby region to ensure timely service support.
8	The OEM shall possess valid certifications: ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 27001:2022, and ISO 50001:2018.
9	OEM shall comply with Government of India Make in India (MII) policy guidelines.

2.4 TELEPHONE SYSTEM

Complete installation shall be done in accordance with installation practices for a well-structured cabling system, using components from a single vendor to ensure consistent and assured performance. The structured cabling distribution network shall serve as a vehicle for transport of data, video and voice telephony signals throughout the network.

Installation, termination and identification of wiring between station outlets, Telecom Rooms and the Equipment Room shall be considered part of the contractors work.

Wiring utilized for data and voice communications shall originate at owner provided hubs and concentrators either wall mounted, in vertical free standing equipment racks, and/or enclosed wall mounted vertical equipment racks located at the Telecommunications Equipment Room (ER), the Main Cross-connect (MC), the Intermediate cross-connect (IC), and/or the Telecommunications Room (TR) location(s). Wiring, terminations and patch bays between these designated demarcation points and outlet locations designated on the plans shall be considered part of the contract. Telecommunication Outlets (TO) shall be furnished, wired and installed by the structured cabling distribution network system contractor.

The system shall utilize a network of unshielded twisted pair, riser, tie and station cables. Cables and terminations shall be provided and located as shown and, in the quantities, indicated on the drawings.

All cables and terminations shall be identified at all locations.

All cables shall terminate in an alphanumeric sequence at all termination locations.

All balanced twisted pair cable terminations shall comply with, and be tested to TIA/EIA568-B standards for Category 3, Category 5e, Category 6 & Category 6 installations.

The contractor carrying out the SITC shall make the system entirely operational for its intended use, by addition of components specific to its make/model even if not specifically mentioned in the BOQ. Also most current versions of software and applications shall be provided by the contractor, as applicable at the time of execution and commissioning.

The Contractor has to furnish working drawings and as-built drawings, which shall be an essential component of commissioning.

Supported Applications, but not limited to:

- a. Ethernet Applications
- b. IEEE 802.3af Data Terminal Equipment (DTE) Power via Media Dependent Interface (MDI)
- c. Fiber Channel Applications
- d. IEEE 802.11a/b/g Wireless LAN Applications
- e. Digital Subscriber Loop (DSL) Applications
- f. Voice, Video and ISDN Applications
- g. Building Automation Systems (BAS) Applications

2.5 EPABX SYSTEM

EPABX Specifications

IP Based EPABX System equipped with following.

- a. ISDN PRI Line – 02
- b. Analog Trunk Line – 16
- c. Analog Extensions– 216 Expandable up to 512
- d. Digital Extensions– 16
- e. IP Based Operator Console with BLF- 02
- f. In-Skin 16 Port Voicemail- 01
- g. In-Skin Schedule Conference Bridge (Browser based)- Audio: 32 Party x 3 Groups- 01 No. and expandable to 20 Groups
- a. In-Skin Schedule Conference Bridge (Browser based)-Video: 8 Party x 1 Groups- 01 No. and expandable to 4 Groups.
- b. In-Skin Call Billing Software with min 90000 calls storage- 01
- c. In-Skin 4 Channel Video MCU- 01 No.

- d. Modem for Remote Maintenance – 01
 - e. Maintenance Terminal software (GUI and Web Based) – 01
 - f. Music on Hold interface – 01 No.
 - g. Paging Interface / Fire Alarm Interface – 01 No.
 - h. USB Port- 01 No.
 - i. SBC-01 No.
 - j. 250 Channel VOIP Resource per card
 - k. Ad-Hoc/- Meet-me Conference (32 Party x 3 Group; or 16 Party x 6 Group; or 8 Party x12 Group)
 - l. System capacity minimum 1250 port
 - m. Networked System Capacity- minimum 40 systems with upto 50,000 ports in distributed network with full feature transparency e.g. BLF, Call back, CLI, Name, direct dial as intercom etc. within network
 - n. BYOD (Bring your own device) support for minimum 6 devices per user (e.g. combination of GSM; Mobile Client; Analog Extension; Digital extension; IP Extension; Desktop Client etc) with parallel ringing.
 - o. In-built battery charger
 - p. In-Skin UC Functionality (BLF, Instant message/ Chat, Presence, Telephony, Call log, Voicemail etc) and should support min 200 UC Clients without using any external server.
 - q. SIP enabled Communication Server
 - r. Self-Survivable Remote Node/ Gateway
 - s. Non-blocking
 - t. Universal Port Architecture
 - u. Flexible number plan
 - v. Inbuilt battery charger
 - w. In built caller ID
 - x. In built message lamp
 - y. GUI and Web base configuration
 - z. Dual 1000BASE-T/100BASE-TX/10BASE-T Port – Ethernet & VOIP Port
 - aa. IP-DECT Support
 - bb. Mobile client (Android & iOS) with P2P Video Call
 - cc. TEC (IR) and MTCTE certified.
 - dd. IS9000 Certified for Environmental Operating Conditions Operating Temperature: 0 to 45 Degree Celsius Humidity: 10% to 95% (Non Condensing)
- a. Proposed Telephony System Should have valid TEC (IR) and MTCTE approval certificate from an Indian govt. body. Necessary documents to be furnished along with the bid. In absence of these documents the bid shall get rejected without any notice.
 - b. Original Equipment Manufacturer should be ISO9001-2015, ISO/IEC 27001:2013 and ISO/IEC 20000-1:2011 certified and must enclose supporting documents.
 - c. The bidder should produce ink signed OEM authorization with for this tender without which the tender would be rejected.
 - d. The EPABX System, Gateways, Digital Phones, IP Phones, Meeting Manager/ Conference Bridge, Softphone, UC Client etc. should be of the same OEM with a valid service & spare support.

Digital Telephone Instrument

- a. Digital Key Telephones system display should have the following minimum specifications:
- b. 3.5 Inch Tiltable Backlit LCD display
- c. lines x 24 characters per line LCD display with adjustable angle
- d. Separate Visual Message Wait Indicator Lamp with multicolor option
- e. Minimum 24 flexible programmable keys & 4 soft keys support
- f. Dual color LED indication, Backlit Dial Pad
- g. Navigational Keys

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

- h. Incoming Speech Gain Control
- i. Ringer Volume Control
- j. Supports Analog port adaptor for ringer and modem functionality
- k. Full Two Way Duplex speaker phone, RJ9 Headset Port
- l. Wide Size Incoming Lamp with 7 color support
- m. Adjustable Handset and Monitor speaker volume
- n. Monitor Speaker / On-Hook dialing
- o. Call disconnection through cradle switch no magnetic switch will acceptable.
- p. Expandable by additional Button Modules
- q. Should have provision for smart phone collaboration via blue tooth adopter
- r. Should support 8 Key DSS with Dual color LED and not consume any additional port.
- s. ROHS Compliant

Analog Telephone Instrument:

- a. The electronic push button telephone should have following main features.
- b. Pulse or Tone dialing, temporary switch over possible.
- c. CLI (Caller Line Identification) display minimum 3 line 16 character
- d. Speaker phone
- e. Recall key
- f. Last number redial
- g. Ringer volume adjustable
- h. Manual pause
- i. Visual message wait lamp indication for voice mail

List of Acceptable makes:

Note: If any of the makes does not satisfy the NIT Specifications then the same shall not be acceptable. All the materials shall be of ISI mark wherever applicable. All the materials shall be of ISI makes wherever applicable.

No.	Item	Acceptable make
1	Indoor Dome IP Camera (UL listed)	Bosch/Honeywell/ Pelco/ Axis/Sony/Panasonic
2	Outdoor Bullet IP Camera (UL listed)	Bosch/Honeywell/ Pelco/ Axis/ Sony/Panasonic
3	PTZ Camera (UL listed)	Bosch/Honeywell/ Pelco/ Axis/ Sony/Panasonic
4	NVR and Management software	Bosch/Honeywell/ Pelco/ Axis/ Sony/Panasonic
5	Professional LED Display	Sony/ Samsung/LG
6	Work Station	IBM/HP/Dell/Lenovo
7	Co-axial UTP Cat-6/ Cat 6A	Corning/Panduit (Pannet)/ Schneider/ Commscope/Sterlite/Legrand/ Derwiser
8	UPS	Emerson/APC/GE/Delta/Vertiv/ Numeric
9	SMF Batteries	Exide/ Standard /National Panasonic/ Amron / Emco
10	Network Switch	Alkatel/Juniper/Cisco/Nexus/Netcare
11	Rack and Accessories	Valrack/Rittal/Legrand/Sterlite/Schnider/ Derwiser
12	EPABX System	Alkatel / Matrix / Panasonic
13	Digital Key Phone with LCD Display,	Panasonic / Siemens / Beitel / Motorola/Matrix
14	Land line phone, Basic phone	Panasonic / Siemens / Beitel / Motorola/ Matrix
15	Distribution (MDF) Box	Krone / Hensel / A K Electronics/ Matrix
16	Telephone Wires	AKG / Havell / Polycab /Banton Cable/ KEI
17	Interactive Display	Peoplelink/ Globus/ Cisco/ Brio
18	OPS	Peoplelink/ Globus/ Cisco/ Brio
19	Camera	Peoplelink/ Globus/ Cisco/ Brio
20	Speakerphone	Peoplelink/ Globus/ Cisco/ Brio
21	Wireless Presenter	Peoplelink/ Globus/ Cisco/ Brio

Sub Head- XVI– Automatic Fire Alarm System

The work shall be carried out as per CPWD General Specifications for Electrical Works, Part-I: Internal, 2023 and Part-VI Fire Detection and Fire Alarm System- 2018. The soft copy of this specification is available at the link: http://cpwd.gov.in/Documents/CPWD_Publication.aspx

15.1 Works to be done by the Contractor:

In addition to supply, installation, testing and commissioning of all the equipment and materials as per the schedule of work, the following works shall be deemed to be included within the scope of work to be executed by the contractor, whether or not indicated in the schedule of work.

- (i) Extension of the conduit ends up to the FAS / AFAS Equipment and loop earthing as required.
- (ii) All minor building work such as cutting and making good the damages.
- (iii) Necessary testing equipment.
- (iv) Watch and ward of the equipment, materials and installation, till their handing over to the department duly installed and commissioned.
- (v) Approval from the concerned fire authorities as may be required as per the local Fire Regulations and byelaws.

15.2 Inspection of site and collection of data:

The tenderer shall be deemed to have examined the tender documents, detailed specifications, data etc. and to have visited the site or ascertained all relevant details for offering suitable equipment and for the installation work.

15.3 Inspection and testing**Initial inspection and testing**

- (i) Initial inspection of materials & equipment at manufacturer works may be done by the Engineer-in-Charge or his representative. For item/equipment requiring initial inspection at manufacturer works, the contractor will intimate the date of testing of the equipment at the manufacturer's works before dispatch. The contractor shall give sufficient advance notice regarding the dates proposed for such tests to the department representative(s) to facilitate his presence during testing. The Engineer-in-Charge at his discretion may witness such testing. Equipment will be inspected at the manufacturer/authorized dealer's premises, before dispatch to the site by the contractor. The cost of Engineer's visit to the manufacturer/ authorized dealer premises will be borne by the department.
- (ii) The department also reserves the right to inspect the fabrication job at factory and successful tenderer has to make arrangements for the same.
- (iii) The materials shall be dispatched to site of work by the contractor after getting duly inspected by Engineer-in-Charge or his authorized representative.

Final Inspection & Testing

Final inspection & testing will be done by the Engineer-in-Charge or his representative as per details indicated in Appendix-IV & VI under "Installation, testing & commissioning".

The installation will be offered for inspection to local body (Chief Fire Officer), The contractor will extend all help including test facilities to the representative of Chief Fire Officer. In case contractor fails to make desired facilities available during inspection, the department reserves the right to provide the same at the risk & cost of the contractor. The observation of Chief Fire Officer which are a part of agreement shall be promptly attended by the contractor. The installation will be accepted by the department only after receiving clearance from Chief Fire Officer.

Safety Measure:

All equipments shall incorporate suitable safety provisions to ensure safety of the operating personnel at all times. The initial and final inspection reports shall bring out explicitly the safety provisions incorporated in each equipment.

15.4 Terms of payment:

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein;

- (i) 80% after initial inspection and delivery at site in good condition on prorated basis.
- (ii) 10% after completion of installation in all respect,
- (iii) Balance 10% will be paid after testing, commissioning, trial run and handing over to the department for beneficial use including fire inspection.

15.5 Rates

The rates quoted by the tenderer shall be firm and inclusive of all taxes, duties, levies and all charges for packing, forwarding, insurance, freight, delivery, installation, testing and commissioning etc. at site including temporary construction of storage, risks, overhead charges, general liabilities/obligations and clearance from local bodies and State Fire Services, as applicable. However, the fee for these inspections shall be borne by the department.

15.6 Storage and Custody of Material

Watch and ward of the stores and their safe custody shall be the responsibility of contractor till the final taking over of the installation by the department.

15.7 Extent of Work:

The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation to the entire satisfaction of the Engineer-in- Charge. The term complete installation shall mean; not only major items of equipment covered by these specifications, but also incidental sundry components necessary for complete execution and satisfactory performance of the installation, with all labour charges, whether or not these have been mentioned in detail in the tender documents.

15.8 Completeness of tender:

All fittings, unit assemblies, accessories, hardware, foundation bolts, terminal blocks for connections, cable glands, miscellaneous materials and accessories necessary for efficient assembly and working of the equipment shall be deemed to have been included within the scope of work in the tender and within the overall details for complete items whether they have been specifically mentioned or not.

15.9 Certificate of compliance with or departure from specifications:

The tenderers who wish to depart from the provisions in these specifications or system engineering or the detailed requirements in Appendix-I, should list out such departure in the proforma indicated in Schedule 'D' of Appendix-I supported with complete particulars, technical reasons for departure and standards and test certificates. They should, however, quote rates strictly in accordance with the schedule of work in the documents and indicate separately changes in the quoted price due to their proposed departure.

The tenderer shall certify while submitting the offer that except the departure specifically mentioned by him, the work tendered by him shall comply in all respects with the tender specification. Unless this is done, the system shall be considered to comply in every respect with these specifications.

15.10 Drawings and manual to be furnished by the Contractor:

- (a) The contractor shall submit in duplicate the following drawings within a fortnight of the award of work for approval by the department:
 - (i) Layout of detectors, manual call boxes and all other accessories.
 - (ii) Wiring diagram including connection topology for the complete system.
 - (iii) Circuit diagram of individual panels, P.A. system and detectors.
 - (iv) Constructional details of the various control and indicating panels and mimic diagram(s).

- (b) Before commencement of the installation:
The above drawings, with observations of the Department duly incorporated, shall be submitted to the Engineer-in-Charge in triplicate along with any special instructions, with regard to handling, storage and installation.
- (c) Documents to be furnished on completion of installation:
Three sets of the following documents shall be furnished to the department by the contractor on completion of work: -
- (i) Completion drawings
 - (ii) Manufacturer's technical catalogues of all equipment and accessories.
 - (iii) Operation and maintenance manual of all major equipment, detailing all adjustments, operation and maintenance procedures.

15.11 Completion drawings:

Three sets of following laminated drawings shall be submitted by the contractor while handing over the installations to the Department. Out of this one of the sets shall be laminated on a hard base for display in the fire control room. In addition, one soft copy shall also be furnished.

- (a) Installation drawings giving complete details of all the components/items such as detectors, call boxes etc.
- (b) Line diagram and layout of all electrical control panels and work station.
- (c) Control wiring drawings with all control components and sequence of operation to explain the operation of control circuits.

15.12 Coordination with other agencies:

The contractor shall coordinate and cooperate with other agencies by exchange of all technical information as required, like details of weight, over all dimensions clearance and other technical data required for successful and proper completion of his portion of the work in relation to the work of others without any reservation. No remuneration should be claimed from the Department for such technical cooperation. Care shall be taken not to damage any structure. If any unreasonable hindrance is caused to other agencies and any completed portion of the works has to be dismantled and redone for want of the cooperation and coordination by the contractor during the course of work, such expenditure incurred will be recovered from the contractor. If the restoration work is not carried out to the satisfaction of the Engineer-in-Charge the same shall be got done at his risk and cost.

15.13 Care of building:

Care shall be taken while handling and installing the equipment to avoid damage to the building. On completion of the installation, the contractor shall arrange to repair all damages to the building caused during installation so as to bring to the original condition.

15.14 Painting and protection:

Metal work of all equipment to be supplied (except the detectors) shall be given the final coat of paint over the primer after necessary treatment at the works before dispatch. All damages to painting during transport and installation shall be set right or repainted to the entire satisfaction of the Engineer-in-Charge before handing over.

15.15 Guarantee:

The contractor shall guarantee the entire FAS/ AFAS installation as per specifications both for components and for system as a whole. All equipment shall be guaranteed for one year from the date of acceptance against unsatisfactory performance or break down due to defective design, manufacture and/or installation. The installation shall be covered by the condition that the whole installation or any part thereof found defective within one year from the date of taking over shall be replaced or repaired by the contractor free of charge to the entire satisfaction of Engineer-in-Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk & cost of the contractor.

The warranty shall cover the following: -

- (i) Quality strength and performance of materials used.

CORRECTION	NIL	INSERTION	NIL		
CUTTING	NIL	OVERWRITING	NIL	AE(E)	EE(C)

- (ii) Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- (iii) Satisfactory operation during the maintenance period.
- (iv) Performance figures and other particulars as specified by the tenderer under schedule of guaranteed technical particulars.

15.16 After sales service:

The contractor shall ensure adequate and prompt after sales services in the form of maintenance personnel and spares as and when required with a view to minimize the break down period. Particular attention shall be given to ensure that all spares are easily available during the normal life of the installation.

Sub Head-XVI– Manual Fire Alarm System**LIST OF APPROVED MAKES**

The following Makes of material are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any Make stated below does not comply with the technical specification given in the tender then such a Make will not be acceptable.

No.	Item	Acceptable make and Models
1	Addressable Type Photo-thermal Type Smoke Detector with Dual LED / Duct Detector	Edward/Appolo/ Honeywell/ System Sensor/ Siemens/ ASES Security
2	Addressable Type Rate of Rise/ Thermal Detector with Dual LED	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
3	Duct Detector Housing	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
4	Addressable type fault Isolator/Phone Jack/Phone control Module/Fire fighter telephone.	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
5	Response Indicators	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
6	Intelligent Addressable Type Control/Output Modules	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
7	Intelligent Addressable Type Monitor Modules	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
8	Analog Active Main Panel/ Repeater Fire Alarm panel with Backlit LCD Display	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
9	Exit Point Directional Sounder with minimum 4 district Sound patterns/Horn cum storb	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
10	Manual Call box (Pull station Type)	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
11	Addressable Type Loop Powered hi-tone hooter	Edward/Appolo/ Honeywell / System Sensor/ Siemens/ ASES Security
12	Copper conductor PVC cable with steel braided	Finolex / Havells / Polycab / RR Cable/KEI
13	MS steel Conduit & accessories, ISI Marked.	BEC/AKG/NIC/Steel Craft
14	Speakers	Notifier /Bosch/Siemens/ JBL/ Soni/ ASES Security
15	Amplifier	Notifier /Bosch/Siemens/ JBL/ Soni / ASES Security
16	Voice Alarm Control	Notifier /Bosch/Siemens/ JBL/ Soni/ ASES Security
17	Speaker cable	Havells / Polycab / KEI

Sub Head XV: Fire Fighting System (Downcomer System)

The work shall be carried out as per CPWD General Specifications for Electrical Works, Part-I: Internal, 2023 and Part-II, External-2023 & Part-V: Wet riser & Sprinkler system 2020. The soft copy of this specification is available at the link: http://cpwd.gov.in/Documents/CPWD_Publication.aspx

17.1 WORKS TO BE DONE BY THE CONTRACTOR

Unless otherwise mentioned in the tender documents, the following works shall be done by the contractor and therefore, their cost shall be deemed to be included in the tendered cost- whether specifically indicated in the Schedule of Work or not:

- (i) Foundations for equipment including foundation bolts and vibration isolation spring/pads,
- (ii) Suspenders, brackets and floor/wall supports for suspending/supporting pipes.
- (iii) Suspenders and/or cable trays for laying the cables,
- (iv) Excavation and refilling of trenches in soil wherever the pipes are to be laid directly in ground, including necessary base treatment and supports.
- (v) Sealing of all floor slab/wall openings provided by the Department or made by the contractor for pipes and cables, from fire safety point of view, after laying of the same.
- (vi) Painting of all exposed metal surfaces of equipment and components with appropriate colour.
- (vii) Making openings in the walls/floors/slabs or modification in the existing openings wherever provided for carrying pipe line, cables etc.
- (viii) All electrical works including cable/wires, earthing etc. beyond power supply made available by the department.
- (ix) Making good all damages caused to the structure during installation and restoring the same to their original finish.
- (x) Approval from local fire authorities as may be required as per local bye-laws. (The contractor's responsibility shall be limited to the work executed by him.)

17.2 POWER SUPPLY, WATER SUPPLY AND DRAINAGE**Power Supply**

- (i) power supply for execution of the work shall not be provided by the department. Contractor has to make his own arrangement for the same.
- (ii) The power supply for testing and commissioning of the complete installation shall be made available by the Department free of charge to the contractor. For this purpose, the power supply shall be given at the main incomer unit of the electrical panel to be provided by the contractor. The termination of this feeder in the main incomer unit shall be the responsibility of the contractor and nothing extra shall be paid on this account.
Unless otherwise specified in the contract, further power distribution to the various equipment shall be done by the contractor.
- (iii) Where the power supply has to be arranged by the Department at more than one point as per the terms of the contract, the termination of all such power feeders in the incomer of respective control panels to be provided by the contractor shall be the responsibility of the contractor and nothing extra shall be paid on this account.
- (iv) The contractor shall use the power supply only for the bonafide use of the work. No major fabrication work shall be done at site. Power shall be used only for welding/cutting works. The power supply shall be disconnected in case of such default and the contractor shall then have to arrange the required power supply at his cost.
- (v) In case of composite contracts, having Firefighting work as one of the works, these arrangements shall be made by the agency/ contractor only.

Water Supply

Water supply shall be made available to the contractor by the Department free of charge at only one point for installation. Further extension if required shall be done by the contractor at his cost.

In case of composite contracts, having Firefighting work as one of the works, this arrangement shall be made by the agency/ contractor only.

CORRECTION	NIL	INSERTION	NIL		
CUTTING	NIL	OVERWRITING	NIL	AE(E)	EE(C)

Drainage

- (i) Drain traps in pump room shall be arranged by the department.
- (ii) Piping Connections from the equipment to the drain trap shall be done by the contractor. These items of work shall be measured and paid as per contract.
In case of composite contracts, having Firefighting work as one of the works, this arrangement shall be made by the agency/ contractor only.

17.3 Machinery for Erection

All tools and tackles required for unloading / handling of equipment and materials at site, their assembly, erection, testing and commissioning shall be the responsibility of the contractor.

17.4 Completeness of the tender: -

All sundry equipment, fittings, assemblies, accessories, hardware items, foundation bolts, supports, termination lugs for electrical connections, cable glands, junction boxes and all other items which are useful and necessary for proper assembly and efficient working of the various equipment and components of the work shall be deemed to have been included in the tender, irrespective of the fact whether such items are specifically mentioned in the tender or not.

17.5 Submission of programme: -

Within fifteen days from the date of receipt of the letter of award, the successful tenderer shall submit his programme for submission of drawings, supply of equipment, installation, testing, commissioning and handing over of the installation to the Engineer-in-Charge. This programme shall be framed keeping in view the building progress and the Milestones fixed in Schedule 'F' Clause-5 of General Conditions of Contract. Items like piping etc. that directly affect the building progress shall be given priority. Hose pipes, branch pipes, first aid hose reel pipes shall be supplied just before commissioning the system.

17.6 Submission of Drawings: -

The contractor shall submit the drawings to the Engineer-in-Charge for approval before start of work.

17.7 Commencement of work: -

The contractor shall commence work as soon as the drawings submitted by him are approved either in full or in part as the case may be.

17.8 MATERIAL APPROVAL

The material brought at site shall be approved by the Engineer-in-Charge before use in the work. In case during execution any material being used in the work is found not as per agreement specifications, Engineer-in-Charge may issue instruction to the contractor to remove the material from site and the contractor will be bound to do so.

17.9 DISPATCH OF MATERIALS TO SITE AND THEIR SAFE CUSTODY

The contractor shall dispatch materials to site in consultation with the Engineer-in-Charge. Suitable lockable storage accommodation shall be made available free of charge temporarily. Watch and ward however, shall be the responsibility of contractor. Programme of dispatch of material shall be framed keeping in view the building progress. Safe custody of all machinery and equipment supplied by the contractor shall be the responsibility of the contractor till final taking over by the department.

17.10 CO-ORDINATION WITH OTHER AGENCIES

The contractor shall co-ordinate with all other agencies involved at the site of work so that the work of other agencies is not hampered due to delay in his work. Piping, cabling or any other work, which directly affect the progress of work of other agencies, shall be given priority.

17.11 QUALITY OF MATERIALS AND WORKMANSHIP

- (i) The components of the installation shall be of such design so as to satisfactorily function under all conditions of operation.
- (ii) The entire work of manufacture/fabrication, assembly and installation shall conform to sound engineering practice.
- (iii) All equipment and materials to be used in work shall be manufactured in factories of good repute having excellent track record of quality manufacturing, performance and proper after sales service.

17.12 CARE OF THE BUILDING

Care shall be taken by the contractor during execution of the work to avoid damage to the building. He shall be responsible for repairing all such damages and restoring the same to the original finish at his cost. He shall also remove all unwanted and waste materials arising out of the installation from the site of work from time to time.

17.13 COLOUR SCHEME FOR THE EQUIPMENT AND COMPONENTS

Equipment and entire metal work above ground level shall be painted as per General Specification for part-V (Wet Riser & Sprinkler System- 2020)

17.14 INSPECTION AND TESTING**Initial Inspection and testing**

- (i) Initial inspection of materials and equipment at manufacturer's works may be done by the Engineer-in-Charge or his representative. For item/ equipment requiring initial inspection at manufacturer's works, the contractor will intimate the date of testing of equipment at the manufacturer's works before dispatch. The contractor shall give sufficient advance notice regarding the dates proposed for such tests to the department's representative(s) to facilitate his presence during testing. The Engineer-in-charge at his discretion may witness such testing. Equipment will be inspected at the manufacturer/ authorized dealer's premises, before dispatch to the site by the contractor.
- (ii) The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make arrangements for the same.
- (iii) The materials duly inspected by Engineer-in-Charge or his authorized representative shall be dispatched to site by the contractor.
- (iv) No additional payment shall be made to the contractor for initial inspection/testing at the manufacturer's works by the representative of the Engineer-in-Charge. However, the department will bear the expenses of its representative deputed for carrying out initial inspection/testing.

17.15 Final Inspection and Testing

Final Inspection and testing will be done by the Engineer-in-Charge or his representative. The installation will be offered for inspection of local bodies (Chief Fire Officer). The contractor or his representative shall attend such inspection of the Chief Fire Officer, extend all test facilities as are considered necessary, rectify and comply with all observations of the Chief Fire Officer which are part of the agreement and arrange for obtaining necessary clearance certificate in favour of the department. In case the contractor fails to attend the inspection and make desired facilities available during inspection, the department reserves the right to provide the same at the risk and cost of the contractor and impose penalty for the same. The installation will be accepted by the department only after receiving clearance from Chief Fire Officer for the work executed by the contractor under the agreement.

17.16 Safety Measures

All equipment shall incorporate suitable safety provisions to ensure safety of the operating personnel at all times. The initial and final inspection reports shall bring out explicitly the safety provisions incorporated in each equipment.

17.17 GUARANTEE

- (i) The contractor shall guarantee the complete system to provide the specified flow and pressure under all conditions at outlets.
- (ii) All equipment shall be guaranteed for a period of 12 months from the date of acceptance and taking over of the installation by the Department against unsatisfactory performance and/or breakdown due to defective design, material, manufacture, workmanship or installation. The equipment or component or any part thereof so found defective during the guarantee period shall be repaired or replaced free of cost to the satisfaction of the Engineer-in-charge. In case, it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of Engineering-charge in this regard shall be final.

17.18 TENDER DRAWINGS, DRAWINGS FOR APPROVAL AND COMPLETION DRAWINGS**Tender Drawings**

The drawings appended with the tender documents are intended to show the areas allotted for various equipment, tentative pipe routes. The equipment offered shall be suitable for installation in the spaces shown in these drawings.

Drawings for approval on award of the work the contractor shall prepare and submit following drawings and get them approved from the Engineer-in-charge before the start of the work. The approval of drawings however does not absolve the contractor of his responsibility to supply the equipment/materials as per agreement. In case of any contradiction between the approved drawings and agreement the decision of the Engineer-in-Charge shall be final and binding on the contractor.

- (a) Layout drawings of the equipment to be installed in pump room and terrace
- (b) Drawings showing the details of erection of entire equipment including their foundations
- (c) Plumbing drawings showing the layout of entire piping, diameter and length of pipes, hydrant, air vessel, valves and isometric drawings showing connections to various equipment
- (d) Sprinkler drawing indicating layout and sizes of pipe, location of valves, sprinklers etc.
- (e) Electrical wiring diagrams for all electrical equipment and controls including the sizes and capacities of the various cables and equipment
- (f) Dimensioned drawings of all electrical and control panels
- (g) Drawings showing details of supports for pipes, cable trays etc.
- (h) Any other drawing(s) relevant to the work

Completion Drawings

Three sets of the following laminated drawings shall be submitted by the contractor while handing over the installation to the Department. Out of this one of the sets shall be laminated on a hard base for display in the fire control room. In addition, one set will be given on compact disc.

- (a) Installation drawings giving complete details of all the equipment, including their foundations,
- (b) Plumbing layout drawings giving sizes and lengths of all the pipes and the sizes and locations of all types of valves, and including isometric drawings for the entire piping including the pipe connections to the various equipment,
- (c) Line diagram and layout of all electrical control panels giving switchgear ratings and their disposition, cable feeder sizes and their layout,
- (d) Control wiring drawings with all control components and sequence of operations to explain the operation of control circuits.

17.19 DOCUMENTS TO BE FURNISHED ON COMPLETION OF INSTALLATION

Three sets of the following documents shall be furnished to the department by the contractor on completion of work: -

- (a) Completion drawings
- (b) 3 sets of manufacturer's technical catalogues of all equipment and accessories.
- (c) Operation and maintenance manual of all major equipment, detailing all adjustments, operation and maintenance procedure.
- (d) Name plate details of all equipment.

17.20 AFTER SALES SERVICE

The contractor shall ensure adequate and prompt after sales service in the form of maintenance, spares personnel as and when required and shall minimize the breakdown period.

17.21 PAYMENT TERMS

The following percentage of contract rates shall be payable against the stages of work shown herein:

S.N.	Stage of work	Machinery & Equipment	All other (Pumps and Electrical Panel) items
I	After initial inspection (wherever specified) and delivery at site in good condition on pro-rate basis	80%	70%
II	On completion of installation on prorated basis	10%	20%
III	On testing, commissioning and handing over	5%	5%
IV	After getting NOC from local body	5%	5%

LIST OF APPROVED MAKES

The following makes of material are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any make stated below does not comply with the technical specification given in the tender then such a make will not be acceptable.

S.No.	Description	Makes
1.	Fire Pumps /De-watering pump	Mather & Platt / Kirloskar / KSB/ Grundfoss/ Willo
2.	Electric Motors	Kirloskar/ Siemens/ ABB/ Crompton
3.	G.I. Pipe/M.S. Pipe (ISI Marked)	Tata/ Jindal (Hissar)/Sail/ Zenith
4.	Sluice Valve/Butter Fly Valve/Non return Valve/Dual Plate Check Valve/Y-Strainer (ISI Marked)	Kirloskar / Advance / Sant/Zoloto/ Audco
5.	Branch Pipe/RRL Hose &Nozzels/ Internal/ External hydrant (Landing Valve)/Orifice Plate/Fire Man Axe (ISI Marked)	Newage/ Superex / Minimax/ Padmini/ Lifeguard/ Fireshield/ FLAMEKLOG/ Ceasefire/ /Atasee
6.	First Aid Hose Reel (Drum and Bracket) (ISI marked)	Newage/ Superex / Minimax/ Padmini/ Lifeguard/ Fireshield/ FLAMEKLOG/ Ceasefire /Atasee
7.	Thermo Plastic Texile Reinforced Water Hose (ISI marked)	Kesara/Mitraz/Maitra /Atasee
8.	Pressure Switches	Indfoss/Switzer/System sensor/Danfoss
9.	PVC / XLPE aluminium / copper conductor armoured cables upto 1100 V grade	Havells/ Polycab / Finolex / KEI
10.	Control Cables.	AKG/Havells/Bonton Cable/ KEI
11.	Single Phase Preventor (Current Sensing type)	Minilec / L&T / Siemens /Selec Control
12.	MCCB / MCB/ Isolator	Legrand / Siemens / L& K/ Schneider/ Hager/ ABB
13.	Starters/Contactors	L&K / Siemens / ABB/ MK/ Schneider
14.	Cable Tray (Powder Coated)/ Galvanized	MK / OBO /Legrand / Stelco/ Steel Craft
15.	Installation control Valve	HD Fire/ Mather & Platt/Tyco/Globe
16.	Cable Gland/End Termination Lugs/ Terminal Blocks	Commet/Dowells/Jainson/ HAX
17.	Fire Extinguisher (ISI: Marked)	Padmini/ Lifeguard/ Fireshield/ Ceasefire /Atasee
18.	Air Vessel	Padmini/ LG/ Chawla Fire /Getech/ Newage/ Safex
19.	Diesel engine for fire pump	Kirloskar/Cummins/Ashok Leyland/ Caterpillar /Mitshubishi/ KSB
20.	Pipe Coat Material (Pipe Protection)	Pypkote/ Coalteck
21.	Enamel Paint & Primer Paint	Asian/ Jenson & Nicholson/ Berger/ Nerolac
22.	Pipe Hangers	Camry/Chilly/Hitech/GMGR
23.	Relay	Schneider/ LK/ C&S
24.	Selector Switch	Schneider/ LK/ C&S/ Kay Cee/ Salzer

CORRECTION NIL INSERTION NILCUTTING NIL OVERWRITING NIL AE(E) EE(C)

25.	Indicating Lamp	BCH/ LK/ C&S/ Schneider/ Technic
26.	Electric Control Panels for Fire Fighting System	CPRI approved. (As per Sub-Head – VI)
27.	Pipe Fittings	Unik/ VS/ Saint/ RM
28.	Fire Sealent	Birla 3M/ Hilti
29.	Sprinklers Head	HD/Tyco/Viking / Spray safe
30.	Ammeter/Voltmeter/CTs	Legrand / Siemens / L&T / Schneider/ Hager/ ABB
31.	Deluge Valve	HD Fire/Newage
32.	XLPE Power Cable (ISI Marked)	Polycab/ AKG Havells/ Finolex/ KEI
33.	Water Curtain Nozzles/Sprinkler Heads	Padmini/ HD Fire/ Newage
34.	Cable Tray	MK / OBO/ Legrand/ BEC/ Slotco
35.	Pressure Gauge	Danfoss/ H-Guru/ Fiebig / Switzer/ Manometer/ GIC/ AN Instrument
36.	Flow Switch	System Sensor/ Plotter/ Switzer/ Siement/ Honeywell/ Johnson control/ Rapid cool/ Anegry
37.	Single Phasing Preventor (Current Sensing)	L&T/ Siemens/ Minilec / ABB/Havells
38.	Battery	Exide/ Amarraja/ Lumminus/ Amron/ National Panasonic
39.	Pipe Hangers	Camry/ Chilly/ Hi-tech
40.	Air Release Valves	TBS/ SKG/ ARCO
41.	Sprinkler flexible connection pipe	Newage/ HD/Tyco/Viking /Atasee
42.	Flexible pipe/ Rosette Plate	HD/Tyco/Viking / Spray safe /Atasee
43.	Landing Valves	Newage/ Superex/ Padmini/Omex/Fire guard/Getech /Atasee
44.	Fire Brigade Inlet	Newage/ Superex/ Padmini/Omex/Fire guard/Getech /Atasee
45.	Digital Meter/ Multifunction Meter	Neptune electric
46.	Rubber mat (ISI marked)	Jyoti/ Any other ISI Marked.
47.	Annunciation Panel for sprinkler system	PCD/Safeway/Agni(INDIA)/AIP0.
48.	Any other item not mentioned above.	As per samples approved by NIT Approving authority.

Sub Head: -XIII: UPS Equipment

The work shall be carried out as per CPWD General Specifications for Electrical Works, Part-I: Internal, 2023 and Part-II, External-2023. Amendment up to the last date of submission of tender. The soft copy of this specification is available at the link: http://cpwd.gov.in/Documents/CPWD_Publication.aspx

10.1 General

The successful bidder/ associated agency shall submit the following undertaking from OEM/OEA before placing the order.

- i) Written commitment from OEM/OEA to supply the UPS and delivery schedule as per the requirement of department.
- ii) Certificate from OEM/OEA or authorized service provider of UPS manufacturer for satisfactory installation and commissioning of UPS after completion of the work.
- iii) Required Guarantee of UPS from OEM/OEA in favour of Engineer in charge to cover defect liabilities.
- iv) An undertaking that mandatory free service shall be carried out during the guarantee period by the authorized service provider of UPS manufacturer.

10.2 SCOPE OF WORK

The Contractor shall furnish and install a three-phase continuous duty, on-line, double conversion, solid-state uninterruptible power system, hereafter referred to as the UPS. The UPS shall operate in conjunction with the existing building electrical system to provide power conditioning, back up and distribution for critical electrical loads. The UPS shall consist of, as required by the project, the UPS module, battery cabinet(s), and accessory, maintenance bypass, and distribution applications, and other features as described in this specification.

- (a) The supply and installation are to be as per schedule of quantity to meet the system design and performance requirements.
- (b) To terminate the cables and make connectivity as per the system design and site requirement.
- (c) Cabling shall be carried out as per the design of the firm executing the UPS system. In case the electrical contractor is executing the Cabling the firm entrusted with the UPS system shall co-ordinate with the electrical contractor for Cabling. Circuitry diagram and specifications shall be provided by the successful tenderer. The tenderer is fully responsible for the quality of the UPS system. Interconnections and termination of cables for the UPS system shall be the responsibility of the tenderer.
- (d) Testing and commissioning of the system
- (e) Training and documentation
- (f) Maintain the system during one year warranty period commencing from the date of commissioning of the building

10.3 The following are to be submitted after award of work and before commencement of work for approval for CPWD:

- (a) Circuitry Diagram along with components
- (b) One set of technical catalogues of all the equipment to be used in the system.
- (c) Tenderer shall make good the system at his own cost in case the system performance is below the desired standard after completion of work. No price increase shall be entertained. Tenderer shall conduct the site survey before quoting if required.
- (d) The successful tenderer shall submit two copies of operation manual of the system proposed which shall also include basic trouble shooting guidelines.
- (e) At least Two officials of CPWD shall be trained in operation and maintenance of the system.

10.4 SYSTEM DESIGN

The UPS system shall meet the following requirements:

- (a) The system should be of fully microprocessor based and control through BMS via Modbus and J bus protocols.

CORRECTION	NIL	INSERTION	NIL	
CUTTING	NIL	OVERWRITING	NIL	AE(E) EE(C)

- (b) The system should be on line double conversion ie load independent from both main's voltage and frequency. Ensure Server-grade high quality of power.
- (c) The system should have IGBT based PWM inverter resulting perfect sine wave voltage.
- (d) The system should be wide input voltage tolerance (+10/-15%).
- (e) The system should be wide input frequency tolerance (+ / - 3%).
- (f) The system should be advance battery management system with programmable automatic battery testing, constantly monitors the health of the battery pack keeping the battery ready to work for emergency situations.
- (g) The system should be high overload capacity of static bypass.
- (h) The system should be built in maintenance bypass.
- (i) Front access for easy replacement and maintenance.
- (j) The system should have hardware for fault diagnostic unit, data logger and power monitoring system.
- (k) The system should have comprehensive Display panel having three functional sections such as
Mimic : LED Display indicates the status of UPS.
Control : Touch membrane switches for ON, OFF, RESET, Audiable Alarm and STOP functions.
Display : As per manufacturer standard.

10.5 Payment Terms

No advance payment shall be made.

On account payments for part work (after stipulated and statutory deductions) as assessed by the Engineer – in-charge for the applicable items in the Contract shall be payable at part rates not exceeding the percentage indicated against the stages of work.

Stage of Work % of rates payable

- a) at site in good condition after initial inspection
(Wherever specified) on pro-rata basis for UPS70 %
- b) On completion of Pro-rata installation (a 2)20%
- c) The final payment shall be made after Completion,
testing & commissioning of the installations to the entire
satisfaction of the Engineer-in-Charge, approval from
local bodies and handing over the site/installation to the
Department in good working condition10%.
- d) For other items, the part rates will be decided by the Engineer-In-Charge of the work and shall be binding on the Contractor. The Sub-Standard work if any, shall not be accepted & measured unless approved by the competent authority.

The Engineer-in-Charge reserves the right to recover any part/item not executed, due to site requirements etc. The rates of such items shall be derived by the Department as per the provision sin the agreement or decided by the Engineer-in-Charge, and shall be binding & acceptable to the contractor.

LIST OF APPROVED MAKES

The following Makes of materials are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any Make stated below does not comply with the technical specification given in the tender then such a Make will not be acceptable.

S.No	Description	Makes
1	UPS	APC / Emerson (Vertiv)/ Toshiba/Delta/ Numeric/Eaton
2	FRLS Copper Conductor PVC Insulated Wires	Finolex / Havell /Polycab/ AKG/ KEI
3	Maintenance free batteries	Exide / Lumminus / Amaron/ Amarraja
4	Electrical Panel / MCB / MCCB	Legrand / Siemens / L&K / Schneider

Sub Head XIV: Solar Photovoltaic System

The work shall be carried out as per CPWD General Specifications for Electrical Works, Part-I: Internal, 2023 and Part-II, External-2023. The soft copy of this specification is available at the link: http://cpwd.gov.in/Documents/CPWD_Publication.aspx

20.1 ADDITIONAL CONDITIONS FOR SOLAR PV PLANT

- 20.1.1** The scope of work for the bidder include obtaining No Objection Certificate (NOC) from Distribution Company (CSPDCL) for grid connectivity, complete design, engineering, manufacture, supply, storage, civil work, erection, testing and commissioning of the grid connected rooftop Solar PV project.
- 20.1.2** The support mounting structure / elevated structure & foundation of solar PV modules shall be so designed to withstand a wind speed 150 km/hr. The contractor shall arrange vetting/approval of the Structural drawing of mounting Structure/elevated structure for solar PV modules from NIT/ IIT . He shall also arrange the visit of structural Engineer to ascertain that existing R.C.C slab is strong enough to take this additional load of mounting structure along with solar PV modules. All co-ordination and necessary fees for approval of drawings shall be paid by the Firm. Nothing extra shall be paid on account on this account.
- 20.1.3** Warranty: 25 Years performance warranty shall be provided by manufacturer on SPV modules with degradation in performance maximum 10% after 10 years and 20% after 25 years as per industrial standard warranty conditions on complete system from the date of commissioning of the system. If SPV modules do not perform satisfactorily as above then the manufacturer of the solar PV modules shall make proper check of the quality of material and should replace the unsatisfactorily solar PV modules with free of cost. Otherwise department may take action to debar the manufacturer for CPWD works and may intimate to MNRE to take suitable action against such defaulting manufacturer.
- 20.1.4** The trial run of electrical work / equipment shall be carried out by the firm in presence of Engineer-in-charge or his representative at the site as per requirement of department.
- 20.1.5** The Power Purchase Agreement shall be taken up by Client / Engineer-in-charge or his representative (As per case may be) separately with CSPDCL. The Contractor shall liaison with the CSPDCL for the approval and finalization of the PPA. The necessary documentation shall be done by the contractor.
- 20.1.6** The application for Net Metering / bidirectional meters shall be furnished by the client department and necessary fees shall be paid by the CPWD. The Contractor shall liaison with the CSPDCL for the necessary documentation and obtaining the Net metering arrangement. The agency has to liaison for obtaining the HT Net metering for **SIB Mahasamund**.
- 20.1.7** All equipment and materials to be used in work shall be manufactured in factories of good repute having excellent track record of quality manufacturing, performance and proper after sales service. The Department reserves right to inspect Solar PV Panels at factory/Manufacturers premises during the course of manufacturing at any stage and the department shall be provided with the proof of using the approved make of PV Cells in the manufacturing of solar PV Modules. The Contractor shall intimate the schedule of manufacturing of modules at factory prior to taking up in the production.

20.2 TECHNICAL SPECIFICATIONS

- 20.2.1** The scope of work involves design, supply, installation, testing and commissioning of complete Solar PV system as per BOQ and these specifications. The drawings along with detailed design and equipment datasheet shall be submitted for approval before starting the work. The work shall be carried out as per designs approved by the Department. The contractor shall submit the design of SOLAR PV system for each building immediately after the award of work.
- 20.2.2** The tentative capacity of Solar PV system is given below for guidance. **The power generated is intended to be used in the entire campus. The LT Power Cabling shall be laid accordingly.**

CORRECTION	NIL	INSERTION	NIL		
CUTTING	NIL	OVERWRITING	NIL	AE(E)	EE(C)

S. No.	Name of Buildings	Proposed Approx. Solar Power plant Capacity
1	SIB Mahasamund	5KWp

NOTE: The Quantities given might increase or decrease as per the actual layout and design. The inverter capacity and other accessories shall be decided upon final approval of the layout and capacities by the Engineer in charge.

20.2.3 The Solar PV module shall be installed on the existing roof / and elevated structure as per the site conditions and as per the drawing approved by the Engineer-in-charge.

20.3 Type tests

20.3.1 Type test reports of all major equipment (Solar modules & PCU) shall be submitted to the Engineer in Charge. The type test report shall be within 5 years from bid opening date, in absence of which fresh type test shall be done without any extra cost.

20.4. Installation and commissioning

20.4.1 Detailed project execution program shall be submitted along with the offer. The contractor will be responsible for arranging all tools & plants for installation and commissioning the complete system.

20.4.2 The contractor shall also submit the erection, testing & commissioning procedure for approval to the owner. These procedures will form integral part of the acceptance report for successful erection and commissioning the system. These reports will be prepared and signed by contractor's representative & representative of Client/CPWD.

20.5 Training & after sales service

20.5.1 Training and after sales service is an important component of supply and is included the scope of work. An explanation of preventative maintenance schedule, plan of operation, scope and implementation of the after sales service shall be imparted to the Operating personnel of the Client/ CPWD.

20.6 Documentation

20.6.1 Three sets of installation manual / user manual shall be supplied along with the each power plant. The manual shall include complete system details such as array layout, schematic of the system, inverter details, working principle etc. Step by step maintenance and troubleshooting procedures shall be given in the manuals. The contractor shall supply three sets of soft copies (in CD form) of all documents including drawings and user manual and three sets in hard copy.

20.7 Standard to be followed:

PV Modules IEC 61215/ IEC61730

Power Conditioners IEC 61683/ IEC60068-2

Charge Controller/MPPT Units: IEC 62093/ IEC 60068-2

Cables IEC 60189/ IS 694/ IS7098

LIST OF APPROVED MAKES

The following makes of material are preferable for use in above work. The material shall be confirming to relevant IS specification and same shall bear ISI marking, wherever available. If any make stated below does not comply with the technical specification given in the tender then such a make will not be acceptable.

S.No.	Description	Makes
1.	Solar PV Cells and Modules	Waree Engineer Ltd./TATA Power Solar/ Adani Solar/Inter Solar /Vikram Solar/ REC Solar/ BHEL
2.	Power Conditioning Unit (PCU)/ Solar Invertor	Waree Engineer Ltd./TATA Power Solar/ Adani Solar/ Inter Solar /Vikram Solar/ REC Solar/ BHEL
3.	Accessories/Connecters	MC/ Tyco/ Solarlok
4.	Data logger/System performance	ABB/KACO /Energy Recommerce /Energy Tracking Ilc/SMA America/ Schlumberger
5.	GI Race way	OBO/ Legrand/ MK/ Schneider Electric/ Profab
6.	Surge Protection Device	Schneider Electric/ OBO/ L&T/Legrand
7.	Solar Cables(XLPO)	Havells / KEI/ Polycab/ Rialto Cable/
8.	GI / MS 'C' class pipes duly ISI marked	Jindal (Hissar)/ TATA / ZENITH/SAIL
9.	DWC pipe	TeleRex / Dutron/ Veekay Plast / Duroline/ CPE
10.	GI pipes	Tata / Jindal / Zenith/ Surya/ SAIL
11.	Glands / Lungs	Dowells / Comet / Jainson