

PART- C

PROFORMA OF SCHEDULES (Electrical Works)

(Separate Performa for Civil, Elect. & Hort. Works in case of Composite Tenders)
(Operative Schedules to be supplied separately to each intending tenderer)

SCHEDULE 'A'

Schedule of quantities (sheet Attached)

SCHEDULE 'D'

Extra schedule for specific requirements/ document for the work, if any.

-----NIL-----

SCHEDULE 'E'

Reference to General Conditions of contract. Applicable GCC is **CPWD GCC Maintenance Works 2023** as modified and corrected upto previous days of last date of submission of tenders.

Name of Work : *Renovation of Kala bhawan and General Toilet at NCZCC, Allahabad. (SH:- Electrical Work)*

Estimated cost of the work :

Electrical Items of Work : **Rs. 11,65,859/-**

i) Earnest money: : Indicated in schedule F of Civil component

ii) Performance Guarantee: : Same as in civil component

Security Deposit : Same as in civil component

SCHEDULE 'F'

General rules and directions:

Officer inviting tender

Executive Engineer, CPWD, Allahabad

Maximum percentage of quantity of items of work to be executed beyond which rates are to be determined in accordance with Clause 12.2.& 12.3

See below

Definitions:

2(v) Engineer-in-Charge

**Executive Engineer (E), CPWD,
Prayagraj**

2(viii) Accepting Authority

Same as civil component.

2(x) Percentage on cost of materials and

15%

labour to cover all overheads and profits

- 2(xi) Standard Schedule of Rates: DSR 2025 for electrical works & MR.
- 2(xii) Department Central Public Works Department
- 9(ii) Standard CPWD contract Form GCC 2020, CPWD Form 7/8 as modified & corrected upto Applicable GCC is CPWD GCC **Maintenance Works 2023** as modified and corrected upto Previous days of last date of submission of tenders.
(Whether or not all the amendments in the form of latest circular issued are duly signed and incorporated in this tender or contract document)

Clause 1

- (i) Time allowed for submission of Performance Guarantee, programme chart (Time and progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW welfare board or proof of applying thereof from the date of issue of letter of acceptance **As per civil component**
- (ii) Maximum allowable extension **with late fee @ 0.1% per day of Performance Guarantee amount beyond the period as provided in (i) above** **As per civil component**

Clause 2

Authority for fixing Compensation under Clause 2

**Superintending Engineer,
CPWD, Prayagraj or successor thereof.**

Clause 2 A

Whether Clause 2A shall be applicable

No

Clause 5

Applicable clause 5/ Clause 5A
Number of days from the date of issue of letter of acceptance for reckoning date of start Mile stone(s)
as per table given below: -

**As prescribed in civil component
As prescribed in civil component**

S. No	Description of mile stone	Time Allowed in days (from date of start)	Amount to be withheld in case of non-achievement of milestone
1	Same as prescribed in civil component.		
2			
3			
4.			

Time allowed for execution of work

As per Civil Work

Authority to decide

Extension of time

Engineer-in-Charge of civil component of work or successor thereof.

Rescheduling of mile stone
Shifting of date of start in
case of delay in handling
over of site

Superintending Engineer, CPWD, Prayagraj or successor thereof

Superintending Engineer, CPWD, Prayagraj or successor thereof

PROFORMA OF SCHEDULE Clause 5 Schedule of handing over of site

Part	Portion of site	Description	Time Period for handling over reckoned from date of issue of letter of intent
Part A	Portion without any hindrance	Entirely Available	As prescribed in civil component
Part B	Portions with encumbrances	-	-
Part C	Portions dependent on work of other agencies	-	-

Clause 6

Computerized Measurement Book:

EMB

Mode of Measurement:

EMB

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.

3 Lakh.

Clause 7A

Whether Clause 7A shall be applicable

Yes

Clause 10A

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

As per list

Clause 10B(ii)

Whether clause 10-B(ii) shall be applicable

No

Clause 10C

Component of labour expressed as percentage of value of work

N/A

Clause 10CC

N/A

Schedule of component of other Materials, Labour etc. for price escalation. Component of civil (except materials covered under clause 10CA)/ Electrical construction value of work	N/A
Component of Labour -Expressed as percent of total value of work.	N/A

Clause 11

Specification to be followed for execution of work:

As per CPWD Specification for Electrical works Part-I Internal-2023, Part-II External Electrical works- 2023 all amended up to date.

Clause 12

12.2 (C)

Deviation limit beyond which clause 12.2 (c) shall apply for building work

As prescribed in civil component

(i) Deviation limit beyond which clause 12.2 (c) shall apply for foundation work (except items mentioned in earth work subhead in DSR and related items)

As prescribed in civil component

(ii) Deviation Limit for items mentioned in earth work subhead of DSR and related items

As prescribed in civil component

Clause 16

Competent Authority for Deciding reduced rates:

Superintending Engineer, CPWD, Prayagraj or successor thereof

Clause 18

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

As per attached

Clause 19C	Authority to decide penalty for each default.	Engineer-in -charge or successor thereof
Clause 19D	Authority to decide penalty for each default.	Engineer-in -charge or successor thereof
Clause 19G	Authority to decide penalty for each default.	Engineer-in -charge or successor thereof
Clause 19K	Authority to decide penalty for each default.	Engineer-in -charge or successor thereof

Clause 25

(i)	Conciliator	As prescribed in civil component
(ii)	Arbitrator Appointing Authority	As prescribed in civil component
(iii)	Place (Seat) of Arbitration	As prescribed in civil component

Clause 32

As prescribed in civil component

Sl. No	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical/ Technical Representative)	Minimum Experience	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i)	
						Figures	Words
1.	-	-	-	-	-	-	-

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.

Diploma holder with minimum 10 years relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Clause 38

- | | | | |
|-----|----|---|----|
| i) | a) | Schedule/ statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2025 printed by CPWD. | NA |
| ii) | | Variations permissible on theoretical quantities | |
| | a) | Cement for works with estimated cost put to tender not more than Rs. 25 lakhs.
For works with estimated cost put to Tender is more than Rs. 25 lakhs | |
| | b) | Bitumen all works | NA |
| | c) | Steel reinforcement and structural steel Sections for diameter, section and category. | |
| | d) | All other materials | |

ANNEXURE

Clause- 10 –A & 18

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

- | | | |
|-----|---|---------------|
| 1. | <i>Steel/Aluminium Ladder 1.5 m to 8 m.</i> | <i>1 Nos.</i> |
| 2. | <i>Chase cutting machines.</i> | <i>1 Nos.</i> |
| 3. | <i>Electrical wire drawing equipment.</i> | <i>1 Set.</i> |
| 4. | <i>Torque wrench for nut/bolt/screws.</i> | <i>2 Nos.</i> |
| 5. | <i>Conduit die set.</i> | <i>2 Set.</i> |
| 6. | <i>Pipe vice.</i> | <i>1 No.</i> |
| 7. | <i>Bench vice.</i> | <i>1 No.</i> |
| 8. | <i>L.T.Megger 500/1000 volts.</i> | <i>1 No.</i> |
| 9. | <i>Tong Tester.</i> | <i>1 No.</i> |
| 10. | <i>Multimeter.</i> | <i>1 No.</i> |
| 11. | <i>Hydraulically operated & hand operated crimping machine.</i> | <i>1 No.</i> |
| 12. | <i>Earth tester.</i> | <i>1 No.</i> |
| 13. | <i>Portable Ordinary drilling machine.</i> | <i>2 Nos.</i> |
| 14. | <i>Portable Hammer drilling machine.</i> | <i>2 Nos.</i> |
| 15. | <i>Overhead conduit puller.</i> | <i>1 No.</i> |

Eligibility condition for Associate agency for execution of E&M part of Works.

1. The tenderer should either himself meet the eligibility conditions for execution of minor component of work i.e. E&M work (i/c specialized E&M) Works or otherwise he will have to associate with agencies, fulfilling the eligibility requirements prescribed in the tender document.
 2. In case the main contractor is himself eligible (as per eligibility criteria) for executing all or some components of E&M work and intends doing job himself, he may not be required to associate with another agency for such components of E&M work 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(s) within one month of award of work or 15 days before start of electrical related work whichever is earlier.
 3. In case, the main contractor himself is not eligible (as per eligibility criteria) for executing any of the components of E&M work, he can directly procure the equipment of approved make from OEM and get it installed from authorized agency/service provider of the OEM or specialized agency as per criteria mentioned for associate eligible agency.
 4. In case the main contractor himself is not eligible (as per eligibility criteria) and also not willing to directly procure the equipment as per para above, he will have to associate with him eligible agencies for doing such components of E&M work of work. In such cases the main contractor has to submit proposal for approval of associate agency along with documents in support of fulfilling eligibility criteria mentioned for associated agency of individual E&M components within one month of award of work or 15 days before start of electrical related work whichever is earlier.
 5. In the event of the associated E&M agency not performing satisfactorily or failure of associate agency to complete the E&M work, the main contractor on written directions of the department, shall remove the Associate agency deployed on the work and shall submit proposal for approval of new associate agency without any loss of time or variation in cost to the department. Such new associate agency shall also give an undertaking along with the main tenderer that both of them shall guarantee for the equipment already supplied for which payment has been released by the department in part. If any equipment supplied for the work, during the currency of the earlier associate agency and paid partly by the department, 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 responsible for replacement of the equipment(s) at no cost to the department. No change of associate agency will be allowed without prior approval of the Engineer-in-charge of the work.
 6. The main contractor shall be responsible and liable for proper and complete execution of the Electrical work and ensure coordination and completion of both civil and electrical work.
 7. The associate contractor shall attend the inspection of the work by the Engineer-in-charge of E&M works as and when required.
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PROPOSAL FOR ASSOCIATING AGENCY FOR E&M WORKS

I/we hereby propose the following agency for execution of E & M work component mentioned herein. Consent Letter from the proposed associated agency is enclosed.

(i) **Name of work:** *Renovation of Kala bhawan and General Toilet at NCZCC, Allahabad. (SH:- Electrical Work)*

- (ii) Component of E&M Work :
- (iii) Name of Associated Agency :
- (iv) Details of Enlistment :
- (v) Category and Class of Enlistment :
- (vi) Monetary limit of work in Enlistment :
- (vii) Validity of Enlistment :
- (viii) Copy of Enlistment Order attached : (Yes /No)
- (ix) Copy of electrical contractor license attached: (Yes /No)
- (x) Copy of completion certificates of similar work experience attached: (Yes /No)
- (xi) Copy GST Registration attached : (Yes/No)
- (xii) Copy PAN Card Attached : (Yes/No)
- (xiii) Consent Letter of agency attached : (Yes/No)

Encls: Self Attested photocopies of as stated above

Seal & Signature of the Main Contractor

Eligibility criteria for main contractor /associated agency for E.I. & Fans works:***(Pdg. E.I. & Fans)***

1. *The tenderer(s) must associate eligible agencies to execute components of E.I. Works who fulfill the prescribed eligibility criteria given below. However, the composite category contractor shall also be eligible to carry out himself any or all of the components of E.I. Works without associating any specialized agency provided:*

- a) *He fulfills the prescribed eligibility criteria respectively for these work(s).*

Or

- b) *He directly procures the equipment of approved make from manufacturer and get it installed from authorized agency/service provider of the manufacturer or specialized agency as per the eligibility criteria mentioned in subsequent para.*

2. ***Internal Electrical Installations, External Lighting/Cabling/Earthing & Service Connection:***

The associate agency shall be registered/enlisted in CPWD in composite category in appropriate class and should have a valid electrical license.

3. ***SUBMISSION OF PROPOSAL FOR APPROVAL OF ASSOCIATED AGENCY:***

- a. *In support of the eligibility conditions of the proposed associated electrical agency, 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 Engineer-in-charge of minor component for deciding the eligibility within seven days of receipt of the same. Such associating electrical agency will certify that they are not debarred as on the day of application for sale of tender.*
 - b. *Proposal for Associating Electrical Agency for the Work shall be submitted in prescribed Proforma along with Willingness Certificate & MOU enclosed herein.*

ON 100 Rs. STAMP PAPER
MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN

Component of E&M WORK:-----

- 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 Contractor]

Name of Work:- *Renovation of Kala bhawan and General Toilet at NCZCC, Allahabad. (SH:-
Electrical Work)*

NIT No. -

Whereas the main contractor has agreed to entrust the above work only to the associated contractor.

We state that MoU between us will be treated as an agreement and has legality as per Indian Contract Act (amended up to date) and the department (CPWD) can enforce all the terms and conditions of this agreement for execution of the above work only in respect of this work. Both of us shall be responsible for the execution of above work as per the agreement to the extent this MoU allows. In case of any delay in the payment by the main contractor, the associated contractor can apply to the CPWD to release the payment under Clause 7B and deduct the same from the bills of the main contractor. In case of any dispute, either of us will go for mediation by the CE or SE (as the case may be) and his decision shall be final and binding on both of us.

We have further agreed as under:

1. *The Associated Contactor will execute above work as per terms and conditions of this agreement.*

2. *All the machinery and equipment, tools and tackles required for execution of the above work, as per this MoU, shall be the responsibility of the Associated Contractor.*
3. *The site staff required for the execution of above work shall be arranged by the Associated Contractor as per terms and conditions of this MoU.*
4. *All the correspondence regarding execution of the above work shall be done by the department with the main contractor. In case of non-compliance of the provisions of agreement of the work by the associated contractor, the main contractor shall be held responsible and action will be taken against him as per agreement provisions.*
5. *In case of non-performance, associated contractor will be debarred from participation or association in the CPWD tenders by the CPWD.*

(Authorized Signatory)

SIGNATURE OF MAIN CONTRACTOR

Date :

Place :

1. Witness with address

(From main contractor side)

(Authorized Signatory)

*SIGNATURE OF ASSOCIATED
CONTRACTOR*

Date :

Place :

1. Witness with address

(From associated contractor side)

WILLINGNESS CERTIFICATE

Name of Work:- *Renovation of Kala bhawan and General Toilet at NCZCC, Allahabad. (SH:- Electrical Work)*

(Pdg. E.I. & Fans)

I hereby give my willingness to work as associated contractor for the above-mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-charge. Also, I will employ full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

Date:

Signature of Contractor

Terms & Conditions

Specification:- The work shall be executed as per CPWD's general specification for Electrical Works part-I (Internal)-2023, Part-II (External)-2023, Part-IV (Sub-station)-2013, IE Rules, Indian Standards amended upto date and as per direction of Engineer-in-Charge. The additional specifications are to be read with above and in case of any variations; specifications given along with the tender shall apply.

Location:- The work is to be executed at **NCZCC, Prayagraj**. The Contractor is advised to visit the site before submission of their tender.

RELATED DOCUMENTS

In the case of discrepancy between the Schedule of Quantities, the Specifications and/ or the Drawings, the following order of preference shall be observed:

- (i) Description of Schedule of Quantities.
- (ii) Particular Specification and Special Condition, if any.
- (iii) CPWD Specifications
- (iv) Indian Standard Specifications of B.I.S.
- (v) Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations, 2010
- (vi) National Electrical Code 2023 as amended up to date and
- (vii) National building code 2016 as amended up to date and Energy Conservation Building Code of India 2017 (ECBC 2017) as amended up to date.

TERMINOLOGY

The definition of terms shall be in accordance with relevant Bureau of Indian Standards of related items, Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations, 2010, National building code 2016, National Electrical Code 2023.

Rates

The work shall be treated as on works contract basis and the rates tendered shall be for complete items of work (except the materials, if any, stipulated for supply by the department) inclusive of all taxes, GST (including works contract tax, if any), duties, and levies etc. and all charges for items contingent to the work, such as, packing, forwarding, insurance, freight and delivery at site for the materials to the supplied by the contractor, watch and ward of all materials (including those, if any, supplied by the department) for the work at site etc.

Prices quoted shall be firm. Price adjustments shall however be governed by Clause 10C/ 10CC of the Conditions of Contract given in form CPWD 7 or 8 of the tender documents, for works executed under these forms. All relevant documents shall be produced by the contractor to the Engineer-in-charge, whenever called upon by him to do so, for working out such adjustments in rates.

Taxes and Duties

Being an indivisible works contract, GST or any other taxes or duties etc. are not payable separately. The GST/works contract tax shall be deducted from the bills of the contractor as applicable in the State in which the work is carried out, at the time of payments.

Mobilization Advance

No mobilization advance shall be paid for the work.

Completeness of Tender

All sundry fittings, assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections as required, and all other sundry items which are useful and necessary for proper assembly and efficient working of the various 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.

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: -

1. Cutting and making good all damages caused during installation and restoring the same to their original finish.
2. Sealing of all floor openings provided by him for pipes and cables, from fire safety point of view, after laying of the same.
3. Painting at site of all exposed metal surfaces of the installation other than pre-painted items like fittings, fans, switchgear/ distribution gear items, cubicle 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.
4. The openings/sleeves for the cables, Conduits, Pipes, ducts, rising mains etc. shall be marked in the drawing and provided during construction. No core cutting / openings in walls shall be allowed one the slab is cast or wall is constructed.
5. Foundation for equipment, poles, supports and brackets (other than for mounting of light fitting) and components wherever required, including foundation bolts.
6. Suspenders and brackets for suspending/supporting cables, as required.
7. Suspenders for cable trays for laying the cables, where required.
8. Excavation and refilling of trenches in soil wherever the pipes/ cables are to be laid directly in ground, including necessary base treatment and supports for pipes as specified.
9. Testing and commissioning of completed installation.
10. Contractor has to submit shop drawing for E.I. for approval to Engineer-in-charge before starting of work

Power & Water Supply: - Responsibility for supply of power & water for execution of work shall be of main contractor.

Tools for Handling and Erection

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.

PAYMENT TERMS

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

Stage of work	Machinery and Equipment
After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis	70%
On completion of installation on pro-rata basis	20%
On testing, commissioning and handing over.	10%

Original copies of supplier's GST invoice showing contract number, goods description, quantity, packing list, unit price and total amount, dispatch detail, test done at factory etc. have to be submitted by agency for ascertaining the genuinity of material source and supply.

Co-ordination with Other Agencies

The contractor shall co-ordinate with all other agencies involved in the building work so that the building work is not hampered due to delay in the work. Recessed conduit and other works, which directly affect the progress of building work, should be given priority.

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 cost all unwanted and waste materials arising out of his work from the site.

Structural Alterations to Buildings

No structural member in the building shall be damaged/altered, without prior approval from the competent authority through the Engineer-in-charge.

Structural provisions like openings, cut-outs, if any, for the work, shall be used. Where these require modifications, or where fresh provisions are required to be made, such contingent works shall be carried out by the contractor at his cost.

All such openings in floors 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.

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.

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.

Work in Occupied Buildings

When work is executed in occupied buildings, there would be minimum of inconvenience to the occupants. The work shall be programmed in consultation with the Engineer-in-charge and the occupying department. If so required, the work may have to be done even before and after office hours.

The contractor shall be responsible to abide by the regulations or restrictions set in regard to entry into, and movement within the premises.

The contractor shall not tamper with any of the existing installations including their switching operations or connections thereto without specific approval from the Engineer-in-charge.

Conformity to The Electricity Act 2003, Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2023

All Electrical works shall be carried out in accordance with the provisions of Indian Electricity Act, 2003 and Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2023, amended up to date (Date of call of tender unless specified otherwise).

General Requirements of Components

SUBMISSION OF PROGRAMME

As per the time stipulated in the NIT from the date of receipt of the letter of acceptance, the successful tender shall submit a program indicating submission of drawings, supply of equipment, installation, testing, commissioning and handing over of the installation to the Engineer-in-Charge. This program shall be framed keeping in view the milestones stipulated in the contract, wherein building progress shall be given priority.

Quality of Materials

All materials and equipment supplied by the contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.

None of the material/ items/ equipment etc supplied shall be more than six months old from date of supply at site. Copy of GST Gate Pass/ Invoice/ Shipment / Custom Clearance certificate/ details (in case of imported equipment) shall be submitted to prove the date of manufacture & genuineness of the equipment/ machines supplied.

Inspection of Materials and Equipment

(a) Materials and equipment to be used in the work shall be inspected by the Departmental officers. Such inspection will be of following categories:

- (i) Inspection of materials/ equipment to be witnessed at the manufacturer's premises in accordance with relevant standards of BIS/ Agreement Inspection Procedure.
- (ii) To receive materials at site with Manufacturer's Test Certificate(s).
- (iii) To inspect materials at the Authorized Dealer's Go downs to ensure delivery of genuine materials at site.
- (iv) To receive materials after physical inspection at site.

(b) The Departmental officers will take adequate care to ensure that only tested and genuine materials of proper quality are used in work.

(c) Similarly, for fabricated equipment, the contractor will first submit dimensional detailed drawings for approval before fabrication is taken up in the factory. Suitable stage inspection at factory also will be made to ensure proper use of materials, workmanship and quality control.

Ratings of Components

(a) All components in a wiring installation shall be of appropriate ratings of voltage, current, an/d frequency, as required at the respective sections of the electrical installation in which they are used.

(b) All conductors, switches and accessories shall be of such size as to be capable of carrying the maximum current, which will normally flow through them, without their respective ratings being exceeded and compliant to related to Indian Standards (BIS).

Conformity to Standards

All components shall conform to relevant Indian Standard Specifications, wherever existing. Materials with ISI certification mark shall be preferred.

Interchangeability

Similar parts of all switches, lamp holders, distribution fuse boards, switch gears, ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

Workmanship

Good workmanship is an essential requirement to be complied with. The entire work of manufacture/ fabrication, assembly and installation shall conform to sound engineering practice.

Proper Supervision/Skilled Workmen

The contractor shall be a licensed electrical contractor of appropriate class suitable for execution of the electrical work. He shall engage suitably skilled/ licensed workmen of various categories for execution of work supervised by supervisors / Engineer of appropriate qualification and experience to ensure proper execution of work. They will carry out instructions of Engineer-in-charge and other senior officers of the Department during the progress of work.

Testing

All tests prescribed in these General Specifications, to be done before, during and after installation, shall be carried out, and the test results shall be submitted to the Engineer-in-charge in prescribed Performa, forming part of the Completion Certificate.

Commissioning on Completion

After the work is completed, it shall be ensured that the installation is tested and commissioned.

Completion Plan and Completion Certificate

For all works completion certificate after completion of work as given in Chapter 17 Appendix E of Internal 2023 (amended upto date) shall be submitted to the Engineer-in-

charge. The proformas as enclosed shall also be referred to for the check list, related necessary action and the testing as applicable.

Completion plan drawn to a suitable scale indicating the following, along with three print copies of the same shall also be submitted along with related soft copy in pen-drive and/ or CD.

- (a) General layout of the building.
- (b) Locations of main switchboard and distribution boards, indicating the circuit numbers controlled by them.
- (c) Position of all points and their controls.
- (d) Types of fittings, viz LED, pendants, brackets, bulk head, fans and exhaust fans etc.
- (e) Name of work, job number, accepted tender reference, actual date of completion, names of Division/Sub-Division, and name of the firm who executed the work with their signature.

WARRANTY

Comprehensively all the goods supplied under the contract shall be new, unused and incorporate all recent improvements in design and materials unless prescribed otherwise in the contract. The supplier further warrants that the goods supplied under the contract shall have no defect arising from design, materials (except when the design adopted and/or the material used are as per the Purchaser's/Consignee's specifications) or workmanship or from any act or omission of the supplier, that may develop under normal use of the supplied goods under the conditions prevailing in India. The warranty shall include all spares, labour and preventive maintenance from the date of completion of the satisfactory installation and acceptance till warranty period.

Schedule of Work

Name of work :- Renovation of Kala bhawan and General Toilet at NCZCC, Allahabad. (SH:- Electrical Work)

Sl. N.	Description of Item	Qty.	Unit	Rate	Unit	Amount	Remarks
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.						
1.1	Group C	50	Pts	2101.00	Pts	1,05,050.00	1.3.3
2	Rewiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable and 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable as earth wire in existing surface/ recessed steel/PVC conduit including dismantling as required.						
2.1	Group C	117	Pts	1064.00	Pts	1,24,488.00	1.15.3
3	Wiring for light/ power plug with 2X4 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	200	Mtr	480.00	P/Mtr	96,000.00	1.5
4	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.						
4.1	2 x1.5 sq.mm + 1x1.5 sq.mm earth wire	200	Mtr	370.00	P/Mtr	74,000.00	1.7.1
4.2	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	350	Mtr	652.00	P/Mtr	2,28,200.00	1.7.4
4.3	2 X 10 sq. mm + 1 X 6 sq. mm earth wire	100	Mtr	778.00	P/Mtr	77,800.00	1.7.5
5	Supplying and drawing following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.						
5.1	3 x 1.5 sq. mm	100	Mtr	104.00	P/Mtr	10,400.00	1.17.3
5.2	3 x 4 sq. mm	100	Mtr	222.00	P/Mtr	22,200.00	1.17.21

6	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 2 nos. 3 pin 5/6 A modular socket outlet and 2 nos. 5/6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	18	Nos	757.00	Each	13,626.00	1.56
7	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	18	Nos	659.00	Each	11,862.00	1.32
8	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required.	27	Nos	807.00	Each	21,789.00	1.57
SH-II (Fans & Fittings)							
9	Supplying, installation, Testing & Commissioning of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5%), life time (LED, Driver & electrical circuitary), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6000°K / 6500°K (As per ANSI Bin), SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be confirming to relevant BIS standards and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 and <120 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement.(Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C) Powder coated die cast /Extruded aluminum Body including trim						

9.1	12 -15 watt	10	Nos	715.00	Each	7,150.00	8.1.3
10	Supplying, installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -5 °C to 40 °C, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM(Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard. Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c external connections with 1.5 sq mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)						
10.1	36 watt	36	Nos	2962.00	Each	1,06,632.00	8.7.4
11	Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85% ,Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6000°K/ 6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/						

	Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy $\geq 105 < 120$ lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast / Extruded aluminium Body (Thickness ≥ 1.20 mm)						
11.1	18- 22 watt	57	Nos	681.00	Each	38,817.00	8.9.1
12	Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminium alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body. Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, remote (preferably mobile app based) for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 0C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC supply Ceiling Fan compliant to IS 374:2019 fan i/c external connections with 1.5 sq.mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required.						
12.1	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	36	Nos	2882.00	Each	1,03,752.00	9.1.3
13	Supplying of Surface type LED Batten mirror light (N.S. 600mm) with aluminium housing, IP 20 rating, minimum 1100 lumen output, colour temperature > 5700K, CRI not less than 80, Luminaries should have 25,000 hrs life @ L70 as per LM 70 and testing as per LM 80, power factor > 0.90, suitable for 220 V - 240 V, system efficiency not less than 110 Lumen per watt, Driver efficiency > 85%, Surge protection - (L-N) 1 KV, (E-L/N) 2 KV, THD < 10%, colour temperature > 5700K, CRI > 80, complete with all accessories etc. as reqd.	12	Nos	499.00	Each	5,988.00	M/R

14	Supplying and fixing LED bulk head fitting, pressure diecast aluminium housing with robust polycarbonate cover, IP66 rating, minimum 700 Lumen output, System efficacy > 110 Lm/W, colour temperature > 6500K, CRI >80, Life >50,000 Hrs @ L70 as per LM 70 and testing as per LM 80 complete with all accessories etc. directly on ceiling/ wall including connections with 3 x 1.5 sqmm FRLS PVC insulated copper conductor single core cable and earthing etc. as required	12	Nos	1306.00	Each	15,672.00	M/R
15	Supplying, Installation, Testing & commissioning of single phase A.C. 230 volt 50 Hz, 300 mm sweep ISI marked metal body exhaust fan, 1400 RPM i/c louver shutter/bird screen i/c connection testing & commissioning etc. as reqd.	10	Nos	3337.00	Each	33,370.00	M/R
16	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator).						
16.1	6 way (4 + 18), Double door	1	Nos	5299.00	Each	5,299.00	2.4.2
17	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)						
17.1	6 way , Double door	1	No	2390.00	Each	2,390.00	2.3.1
17.2	16 way, Double door	3	Nos	3367.00	Each	10,101.00	2.3.4
18	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.						
18.1	Single Pole	46	Nos	285.00	Each	13,110.00	2.10.1
18.2	32 Amp DP MCB	1	Nos.	696.00	Each	696.00	2.10.3
19	Supplying and fixing following rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.						
19.1	63 Amp DP MCB	3	Nos.	1121.00	Each	3,363.00	M/R
19.2	63 Amp FP MCB	1	Nos.	2115.00	Each	2,115.00	M/R

20	Supply of 1 No. XLPE insulated, PVC sheathed, armoured cables with stranded aluminium conductor suitable for rated voltage of 1.1 KV grade confirming to IS:7098 (Pt.1) /88 with ammendment No.1 of following sizes, etc as reqd.						
20.1	3.5 x 35 sq.mm	40	Mtr	478.00	P/Mtr	19,120.00	M/R
21	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.						
21.1	Upto 35 sq. mm	40	Mtr	47.00	P/Mtr	1,880.00	10.5.1
22	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.						
22.1	3½ X 35 sq. mm (32mm)	2	Nos	437.00	Each	874.00	11.1.21
23	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fittingand cutting, jointing etc.direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.						
23.1	63 mm dia (OD-63 mm & ID-51 mm nominal)	35	Mtr	289.00	P/Mtr	10,115.00	15.16.1
Total						11,65,859.00	

PREFERRED MAKES OF MATERIALS FOR E & M

Sl.	Details of Materials/ Equipment	Manufacturer's Name
	<i>I.E.I, MCBDB & MCB, Cables and Wires</i>	
1	<i>MCB, Isolator, Industrial plug Socket, RCCB, RCBO's (ISI Marked/IEC Compliant)</i>	<i>Schneider Electric ACTI-9(N)/ Legrand (DX3)/ LK (Formerly L&T) (Exora)/ ABB (SB200M)/Seimens (Betaguard)/Havells</i>
2	<i>MCBDB & Loose Wire Box</i>	<i>Schneider Electric (Acti-9)/ LK(Exora)/Siemens/ ABB (Elegance)/ Havells/ Legrand (Ekinox)</i>
3	<i>Change Over Switch</i>	<i>LK/ Havells/ Hager/ C&S/ Schneider</i>
4	<i>Automatic Transfer Switch (ATS)</i>	<i>Socomac/Hager/ABB/ LK/Schneider/Siemens</i>
5	<i>FRLS PVC insulated copper conductor single core cable for wiring. (ISI marked)</i>	<i>Finolex/ RR Kabel/ Havells/ Polycab/ KEI/</i>
6	<i>Armoured/Unarmoured Telephone cable, Coaxial Cable</i>	<i>Delton/ Finolex/ RR Kabel/ Havells</i>
7	<i>MS Conduit (ISI marked) with heavy duty MS conduit pipe accessories</i>	<i>BEC/NIC/AKG/RMCON/JPC (Note: The make of accessories shall be same that of conduit pipe and will comply to IS/4768 part 2 2003)</i>
8	<i>PVC conduit (ISI marked) with heavy duty PVC conduit pipe accessories</i>	<i>AKG/ Norpack/BEC/Polypack/Precision/Anchor/ Polycab</i>
9	<i>Modular switches, socket/ telephone socket/ cable TV socket/ data outlet socket/ fan regulator/ GI boxes etc (Wiring accessories)/ regulators/ Motor starter etc.</i>	<i>Legrand / Schneider electric / Honeywell /Havells / ABB / LK (Formerly L&T)</i>
10	<i>Industrial Socket</i>	<i>L&T/Legrand/Schneider/Havells/ABB</i>
11	<i>Selector Switch & Toggle Switch</i>	<i>Salzer (L&T)/ Siemens/ Kaycee/Rishabh/ABB</i>
12	<i>PVC Trunking</i>	<i>MK/ Schneider Electric/ Legrand/OBO</i>
13	<i>GI Pipe</i>	<i>Tata/ Jindal (Hissar)/ Prakash Surya</i>
14	<i>Paints</i>	<i>Nerolac/ Asian/ Berger</i>
15	<i>Terminal Blocks & Connectors</i>	<i>Elmax/Wago/Hensel/Connectwell</i>
16	<i>Phenolic Laminated Sheet/ Bakelite sheet</i>	<i>Hylam/ Formica (P-I Grade)/ Mylam/Greenlam</i>
17	<i>Cat-6 Cable, Co-Axial cables, Telephone Wires & cable</i>	<i>Amp, Avaya/ Beldon/ Legrand/ Molex/ Schneider/ Comscope/ D-Link</i>
	<i>Fans & Fittings</i>	
1	<i>LED Fittings (ISI Marked/BEE Certified)</i>	<i>Wipro/ Phillips/ Havells/Trilux/Lighting Technology/Crompton</i>
2	<i>Exhaust fan/Fresh Air Fan</i>	<i>Havells/Crompton greaves/USHA/ Bajaj</i>
3	<i>Ceiling Fan ISI Marked/BEE Certified)/Wall Fan</i>	<i>Havells/ Crompton Greaves/ USHA/Bajaj</i>
4	<i>Wall Bracket Fitting</i>	<i>Havells/ Decon / Phillips/Lighting Technology/ Luster/ Jaquar/Anchor Panasonic/ Orient Electric/Halonix/Crompton</i>
5	<i>Geysers (BEE Certified)</i>	<i>Racold/CG/Havells/Usha/ Bajaj</i>

	Street Lighting	
1	LED post Top fitting	Wipro/ Phillips/ Havells/ Lighting Technology/Trilux /Crompton
2	LED Street light fitting	Wipro/ Phillips/ Havells/ Lighting Technology/Trilux /Crompton
3	LED street lights with inbuilt Solar panel and controller	Wipro/ Phillips/ Havells/ Lighting Technology/Trilux /Crompton
4	Ornamental MS & G.I pole (factory finish)	Keselec Schreder- Ecopole3m ATG in GI with base plate/ Valmont / Wipro/ Phillips/ Crompton greaves/ Bajaj/Paruthi Engineers Pvt. Ltd./ Luster/Twinkle
5	Hot Dipped Galvanized Octagonal Pole (Factory finish)	Valmont/ Wipro/ Phillips/Crompton Greaves/Bajaj/ Paruthi Engineers Pvt. Ltd.
6	Polycarbonate Junction Box/ Enclosure	Hensel/ Spelsberg/ Naptune-Bals/OBO
7	XLPE Insulated PVC Sheathed Alum./ Copper Conductor Armored Cable of 1.1KV Grade	Finloex/ RR Kabel/KEI/Havells/Polycab
	Sub Station Equipments	
1	LT panel/ Meter Panel Board/ Outdoor Feeder Pillar/APFC panels / Bus ducts	Tricolite Electrical Industries/ C&S/ Sterling & Wilson/ MILESTONE/ Adlec Control System Pvt. Ltd./ Advance Panels & Switchgears Pvt. Ltd./ Associated Switchgears & Projects Ltd/ Pristine/ SPC Electrotech Pvt. Ltd. /ASES/Shalabh/ R P Control/Excel Control System/Asian Switchgear Pvt. Ltd./Precision System Control
2	SMDB	Schneider Electric ACTI-9(N)/Legrand/LK(FORMERLY L&T)(ENERSYS-S)/ABB(Elegance)/Siemens
3	Air insulated Rising Main/ Bus Trunking & accessories	C&S/ L&T/Schneider/Legrand/ABB/Siemens
4	Sandwich type bus Trunking/ Rising Main & accessories	C&S/ L&T/Schneider/Legrand/ ABB/Siemens
5	Moulded Case Circuit Breaker (MCCB) Thermal Release/ Microprocessor Based (Ics=Icu=100%)	Schneider electric NSX series/ Legrand (DPX3)/ L&T(D-Sine)/ABB(T-Max)/Siemens(VL series)
6	Power/ Aux. Contactor 3/4 Pole	Schneider Electric/ Legrand/Hager/L&T/ ABB/ Siemens /C&S
7	Potential transformers/ Current Transformers	Automatic Electric/ Gilbert & Maxwell/ Matrix/ Precise/ L&T/ Kappa
8	LED Type Indicating Lamps/ Push button	Schneider electric /L&T / Siemens/C&S/Vaishno/ABB
9	Over load relays	Schneider Electric/ L&T/ Siemens/C&S/ABB
10	Conventional/Electronic Digital Meters (A/V/PF/Hz/KW/KWH)	Conzerv/ L&T/ Secure/ AE/ C&S
11	Timer	Schneider Electric/ Legrand / Hager / L&T/ABB/Siemens/C&S
12	Fasteners/ GI Clamps	Hilti/ Fisher/ Chilli / GMGR
13	D.W. Corrugated HDPE Pipe (ISI Marked)	REX/ Duraplast/ Duraline

14	Transformer (Oil/ Dry pipe)	Crompton/ ABB/ Schneider/VOLTAMP/Siemens
15	HT Panel/ Ring main Unit	Compton/ Siemens/ ABB/ L&T/ Schneider
16	H.T. Cable (ISI marked)	Finloex/ RR Kabel/KEI/Havells/Polycab
17	HT End Termination/Cable Jointing Kit	Reychem/ Denson/ Cab Seal/safekei/3M
18	ACBs with Display	Schneider Elecric(Masterpact)/Legrand(DMX3MP4)/L&T (U-Power-OMEGA)/ABB(Emax)PR122/Seimens
19	Rubber mat	Jyoti/ Deep Jyoti/ Premier (Duly ISI Marked)
20	Ammeter	Rishab/ L&T/AE/C&S
21	Voltmeter	Rishabh/ L&T/AE/C&S
22	Capacitor and Reactors /APFC Relay	EPCOS/ L&T/ DUCATI/ ABB/ Siemens/ Schneider
23	XLPE Insulated PVC Sheathed Alum./ Copper Conductor Armored/ Unarmored Cable of 1.1KV Grade	Finloex/RR kabel/KEI/ Havells/Polycab
24	Cable Glands Double Compression With Earthing Links	Baliga Lighting/ Comet/ Cosmos/ Dowells/Gripwell
25	Bimetallic Cable Lug	Comet/ Dowells (Biller India)/ Hex Brass (Copper Alloy India) / Jainson/ Action
26	MS/ GI Cable Tray	Pilco/slotco/pasco/MEM/ BEC/ steelways/ Legrand/ RMcon/True leader/R.P. Controls/OBO
27	Programmable Logic Controller (PLC)	Siemens/ Allen Bradley/ L&T/ ABB/Schneider
	DG Set	
1	Diesel Operated Generating Engine	Cummins India/ Caterpillar/ KOEL/ Volvo Penta/Perkins/ Greaves Cotton Limited
2	Alternator	Stamford/ leroy somer/ kirloskar electric/ caterpillar/ Crompton
3	DG Set Canopy/ Enclosure & AMF Panel	As per OEM/OEA of respective DG set manufacturer
4	Alarm Annunciator	Advani Oralikon/ L&T/ Minilec

Note:- In case make of any equipment or material is not specified in the NIT, the matter shall be referred to the NIT approving authority and obtain the approval. Thereafter the agency can proceed with the supply of material.