

TENDER DOCUMENT

FOR

RENOVATION OF GUEST HOUSE IN
NIB CAMPUS, NOIDA.

VOLUME -IV

TECHINICAL SPECIFICATIONS

Tender No: 02/NIB/2017-18/ Engg. (C/E)

APRIL - 2017



NATIONAL INSTITUTE OF BIOLOGICALS

(Ministry of Health & Family Welfare)

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CHAPTER-A

TECHNICAL SPECIFICATIONS

A BRIEF OF REQUIREMENT OF THE WORK:

1. General Scope of Work:

1. Bids are invited for following scope of works to be carried out in NIB Guest House at all the three floors.
 - i) Old concealed GI water pipes in Wash Room and Service Shafts are to be dismantled in all twenty two rooms of Guest House (10 Suites + 12 Rooms). Old fitting & fixtures are to be dismantled. New pipe fittings & fixtures are to be installed.
 - ii) Wash Room flooring, wall Tiles and Wash Basin counter are to be dismantled and new Tiles and Granite Stone counter are to be fixed.
 - iii) A toughed glass partition is to be fixed in wash rooms.
 - iv) Brick Walls, Shafts, Roof Slab etc. which will be cut/ damaged during execution of the works will be made good and finished with existing finish.
 - v) Wooden Plank flooring and Vitrified Tiles flooring is to be done in all the rooms.
 - vi) Walls & ceiling are to be finished with new coats of paint.
 - vii) New electrical fitting and fixture are to be supplied and installed in all the rooms.
 - viii) The activities to be carried out for completion of the work shall include the details as per Bill of Quantities and any extra or additional work as may be ordered by NIB for proper completion of work.

2. The work shall, in general, conform to the latest CPWD Specifications for Civil, Electrical and all other works with up to date correction slips for all sub heads of work as applicable, and, Technical Specifications included in the tender documents, wherever applicable. Wherever any aspect of design/ construction/ material standards is not covered under the above mentioned specification, relevant standards shall be referred to in the order of

precedence which shall be as follows. In the case of discrepancy between the Schedule of Quantities, the Specifications, the following order of preference shall be observed -

- a. Description of Schedule of Quantities
- b. Particular specification and Specific Condition, if any
- c. Contact Clause of general conditions of Contrat for CPWD Works-2014.
- d. CPWD Specifications as mentioned in Schedule 'F'.
- e. Indian Standard Specifications of BIS/NBC/IRC/BS/ASTM
- f. For items not covered by any of the above, the work shall be done, as per sound engineering practices and as directed by the Engineer-in-charge.

CHAPTER-B

TECHNICAL SPECIFICATIONS AND CONDITIONS- CIVIL WORKS

General:

All the civil works for DSR items are to be carried out as per Latest CPWD specifications. In respect of the items not covered in the Latest CPWD specifications, the specifications as per Bill of Quantities shall be followed and as per guidelines under Para-3, Chapter A of this document.

1. GLASS PARTITIONS:

a. GENERAL:

The contractor shall be responsible for design, fabrication, supply, installation, test and guarantee of all items including taking all measures that may be required to complete the work as per specifications.

b. The scope of work shall include:

- i. Fabrication and installation of Glass Partition and Mirrors with approved Fittings system.
- ii. All anchors, fixings, attachments, reinforcements for required for a complete installation, except those specifically indicated as being provided by other trades.
- iii. Finishes, protection coatings and treatments.
- iv. Sealing with approved sealants within and around the perimeter.
- v. Transportation, storage, handling, protection and cleaning.

c. MATERIALS:

i. Glass:

- Glass shall be as specified in BOQ shall be Indian/ imported, it shall be of approved make.
- In toughening of Glass, rolling direction shall be parallel to the width of the glass panel such that waviness if any is parallel to the horizontal and no waviness parallel to the vertical and to ensure that such waviness is of negligible order.

d. FABRICATION:

- Provide holes and cutouts in glass to receive hardware, fittings, rails and accessories before tempering glass. Fully temper glass using horizontal (roller-hearth) process and fabricate so, when installed, roll wave distortion is parallel with bottom edge of door or tile.

- Factory assembled components and factory installed hardware to greatest extent possible.
- e. **EXECUTION:**
- Examine areas and condition for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - Set units in level and plumb.
 - Maintain uniform clearances between adjacent components.
 - Set, seal and grout floor closer cases as required suiting hardware and substrate indicated.
- f. **CLEANING:**
- i. The Contractor shall ensure that all actions are taken during installation to eliminate the effects of corrosive substances on the finishes.
 - ii. The Contractor shall clean both internal and external surfaces to remove corrosive substances, dust or cement / mortar dropping during the installation as may be directed and instructed by the Engineer.
 - iii. The Contractor shall also make good any physical damage to the structure including scratches, dents, abrasions, pitting, etc. to the satisfaction of the Engineer.
 - iv. Manufacturer's delivery or job markings on glass and adhesive for manufacturer's labels shall be either a neutral or slightly acidic material. In no case shall such material be alkaline; any staining of glass by alkaline material will be cause for rejection of the glass.
 - v. After the installation of each pane of glass all markings and labels shall be carefully and completely removed from the panes. Thereafter no markings or labels of any sort shall be placed on the glass.
- g. **PERFORMANCE GUARANTEE:** The contractor shall offer a minimum of 1 (One) year Performance Guarantee for the entire installation carried out.
- h. **MEASUREMENTS:** - Measurements shall be in Sqm. of actual area covered.
- i. **RATE:** - Rate shall include all required labour, material, designing, conveyance, breakage, wastage, supervision, protection till handing over etc. complete.

3. Specification for Wooden Plank Flooring:

(i) Surface Abrasion ≥ 6000 , (ii) Modulus of Rupture $\geq 35\text{N/mm}^2$, (iii) internal Bond $\geq 1.2\text{N/mm}^2$, (iv) Surface Soundness $\geq 1.0\text{N/mm}^2$, (v) Density $\geq 860\text{Kg/m}^3$, (vi) Swelling after 24 hours in water $\leq 12\%$, (vii) Moisture Content- 4%-7%, (viii) Resistance to Concentration of Acid on overlay -Not Visible, (ix) Resistance to Coldness & hotness cycle on Surface- "No cracks and blisters", (x) Resistance to Cigarette burns- "Not visible discoloration, cracks or blisters", (xi) Resistance to Dry-hotness- "No cracks and blisters", (xii) Anti-crack on Surface-0/Grade 0, (xiii) Resistance to Impact $\leq 9\text{mm}$, (xiv) Resistance to Scratch $\geq 4.0\text{N}$, (xv) Resistance to Stain- Not Visible, (xvi) Formaldehyde Emission- $E1 \leq 1.5\text{mg/L}$, (xvi) Anion Emission $\geq 800/\text{cm}^3$.

- a) **MEASUREMENTS:** - Measurements shall be in Sqm. of actual area covered.
- b) **RATE:-** Rate shall include all required labour, material, designing, conveyance, breakage, wastage, supervision, protection till handing over etc. complete.

CHAPTER -C

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS

1 GENERAL:

To provide an electrical system for the distribution of electric power from the point of supply (Electrical Room), all as shown in the drawings and described in these specifications. The quantities mentioned in BOQ are tentative. It will be the bidder's responsibility to work out the exact quantities from drawings or from work site, which trade provides said equipment, materials, tools and labour.

2 SCOPE:

The bidder shall supply, install and commission along with requisite spare, maintenance tools and tackles the following equipment and system in the Project. The scope also covers the detailed engineering and calculations of the various equipment/system mentioned hereunder and the same shall be approved by the Consultant/Architect prior to execution of the job.

- Lighting fixtures and fan as per BOQ.
- Laying and termination of L.T. cables/wires.
- Complete internal building wiring as per specification.
- Safety to personnel and equipment during both operation and maintenance.
- Reliability of Service.
- Ease of maintenance and convenience of operation.

This specification defines the basic guidelines to develop a suitable electrical system as necessary for the commercial building. All data required in this regard shall be taken into consideration to develop a detailed engineering of the system. Site conditions as applicable are mentioned elsewhere.

Compliance with these specifications and/or approval of any of the Contractor's documents shall in no case relieve the Contractor of his contractual obligations.

All work to be performed and supplies shall be affected as a part of contract requires specific approval /review of Owner or his authorised representative. Major activities requiring approval /review shall include but not be limited to the following:

The engineering activities shall comprise the submission for approval of the following:

- Basic engineering documents e.g. overall single line diagram, area classification drawing, overall cable/wire layout, testing, guaranteed particulars of all equipment and maintenance manuals.
- Quality assurance procedures.
- Field testing and commissioning procedures.
- Basic engineering calculations viz. load analysis; load flow, fault level calculations, and voltage drop calculations etc.
- Load sharing and annunciation scheme,
- Area-wise illumination level calculation and preparation of power supply distribution drawing.

Bidder shall be responsible for:

- Detailed co-ordination with other services, shop drawings for various electrical layouts such as lighting layouts, cabling layouts, installation and cable termination details etc. prior to start of work.
- Preparation of bill of materials for cabling, lighting, and miscellaneous items etc.
- Cable schedule.
- Lighting/power DB schedule.
- Interconnection drawing.
- Preparation of as built drawings for all services.
- Any other work/activity which is not listed above however is necessary for completeness of electrical system.

3 CODES & STANDARDS:

The design engineering manufacturing and the installation shall be in accordance with established codes, sound engineering practices, and specifications and shall conform to the statutory regulations applicable in the country.

- Indian Electricity Act.
- Indian Electricity Rules.

IS-732:	Code of practice for electrical wiring installation system voltage not exceeding 650V.
IS-7689:	Guide for control of undesirable static electricity.
IS-3716:	Insulation co-ordination application guide.
IS-8130:	Conductors for insulated electrical cables and flexible cords.
IS-5831:	PVC insulation and sheath of electric cables..
IS-3961:	Current rating of cables/wires
IS-694:	PVC insulated (heavy duty) electric cables for working. Voltage up to and including 1100 volts.

- IS-1554: PVC insulated cables up to 1100 volts.
 IS-6121: Cable glands.
 IEC-754(1): FRLS PVC insulated cable.

Any other standard may be followed provided it is equivalent or more stringent than the standards specified above.

In case of any deviation /conflict of this specification with the codes & standards, the following order of precedence shall govern.

- a) Specification, particular specification if any, and drawings.
- b) Indian regulations/codes and standards.

4 DESIGN CRITERIA:

L.T. Power Distribution Systems:

a.	Voltage	415 V / 240 V
b.	Frequency	50 Hz
c.	Neutral Earthing	Grounded
d.	Short Circuit Fault withstand Capacity	10 KA - 50 KA (1 Sec.) as per B.O.Q. and specification

5 CABLE DETAILS:

- Internal Wiring:- Copper conductor FRLS PVC insulated 1.1 KV grade as per in BOQ

6 INTERNAL ELECTRICAL WORKS:

A. PVC Conduit:

All conduits shall be high impact rigid 2mm thickness PVC heavy duty type and shall comply with I.E.E. regulations for non-metallic conduit 2mm thick as per IS-9537/1983 (Part-III). All sections of conduit and relevant boxes shall be properly cleaned and glued by using epoxy resin glue and the proper connecting pieces. Inspection type conduit fittings such as inspection boxes, drawn boxes, fan boxes and outlet boxes shall be M.S. or otherwise mentioned. Conduit shall be terminated with adopter/PVC glands as required.

B. Accessories:

Conduit accessories such as normal bends, unions, circular junction boxes and pull boxes, locknuts etc. shall be heavy gauge type and approved make. Conduit accessories shall conform in all respects to IS: 3837-1966 with latest amendment. Wherever several conduits are running together, adequately sized adoptable boxes common to all runs shall be used to avoid inserting

inspection boxes in the individual run. Where it is necessary to segregate wiring metal filler shall be fixed with in the box.

Conduits shall be laid before casting in the upper portion of a slab or otherwise, as may be instructed or in accordance with approved drawings, so as to conceal the entire run of conduits and ceiling outlet boxes. Vertical drops shall be buried in columns or walls. Wherever necessary, chases will be cut by the contractor with the help of chase cutting m/c or by hand. Nothing extra shall be paid to the contractor on this account. In case of exposed brick/ rubble masonry work special care shall be taken to fix the conduit and accessories in position along with the building work. Sufficient depth of the chases will be made to accommodate the required number of conduits. The chase will be filled with cement, coarse sand mortar (1:3) and properly cured by watering for one week.

If, a chase is cut in an already finished surface the contractor shall fill the chase and finish it to match the existing finish. Contractor must not cut any iron bars to fix conduits. Conduits shall be kept at a minimum distance of 100mm from the pipes of other non-electrical services. Where the conduit is to be embedded in a concrete member it shall be adequately tied to the reinforcement to prevent displacement during casting, conduits in chases shall be held by steel hooks of approved design at maximum of 100 cm centres. The embedding of conduits in walls shall be so arranged as to allow at least 12mm plaster cover the same. All threaded joints of conduit pipes shall be treated with some approved 'preservative compound' to secure protection against rust.

Suitable expansion joints fittings of approved make and design shall be provided at all the points where the conduit crosses the expansion joint in the building. (Preferably with Pilca metallic watertight conduits). Conduits shall cross at right angles of the joints only.

Separate conduit shall be used for:

- 1) Normal / Emergency light
- 2) 16A power outlets
- 3) Computer Outlets
- 4) Telephone system
- 5) TV Network
- 6) Or any other services not mentioned here.

Wiring for short extensions to outlets in hung ceiling or to vibrating equipments, motors etc. shall be installed in flexible conduits. Flexible conduits shall be formed from a continuous length of spirally wound interlocked wire steel with a fused zinc coating on both sides. The conduit shall be provided with approved type adopter. A separate and accessible earth connection shall bond across the flexible conduit.

Conduit runs on surfaces shall be supported with metal 1.2 mm thick saddles, which in turn are properly secured on to GI spacer to the wall or ceiling. Fixing screws shall be with round or cheese head and of rust proof materials. Exposed conduits shall be neatly run parallel or at right angles to the walls of the building and shall be painted in color matching the adjoining area. Unseemly conduit bends and offsets shall be avoided by using better appearance. Cross cover of conduits shall be minimum and entire conduit installation shall be clean and with good appearance. For surface work, the boxes shall be raised back pattern type, designed for use with distance saddles to give clearance of 6mm between the back of conduit and the fixing surface.

Where conduits are run on steel work, they will be fixed by means of purpose made GI Caddy clips in manner meeting with the approval of the Engineer prior to the installation being carried out. Other methods of fixing may be agreed in special circumstances, but approval must first be obtained from the site engineer.

The spacing of saddles shall be not more than 600mm centers for up to 32mm diameter conduits and at 750mm for conduit sizes of 40mm diameter and above in case of MS conduit and not more than 600 mm for PVC conduit. In addition, saddles shall be fixed at each side of any bend/Tee, or set at a distance of 200mm from the bend/Tee. The holes in the brickwork or concrete for fixing plugs shall be neatly drilled by means of a masonry drill of the appropriate size.

All the GI sheet steel /passivated boxes used for housing switches, plugs, fan regulator etc. shall be five sided conforming to IS: 5133 Part I-1969. Suitable size of boxes shall be provided a minimum of 2 adjustable fixing lugs on vertical sides. Suitable earth terminal inside each box shall be provided. All fixing lugs shall be threaded to receive standard machined chromium plated brass screws. Sufficient number of knockouts shall be provided for conduit entry. Conduits carrying wires of different circuit can terminate in common J.B having metal compartments. Necessary GI pull wires shall be inserted into the conduit for drawings wires. In case conduit pipe is required to cross any RCC beam special adopter boxes shall be provided for crossing & nothing shall be paid extra.

Where conduits are used for non-air-conditioned space to air-conditioned space or into a fan chamber or duct, a junction box shall be installed to break the continuity of such conduit at the point of entry or just outside and conduit shall be sealed around the conductors.

Particular care shall be taken during the progress of the work to prevent the ingress of dirt and rubbish such as plaster droppings into erected conduits. Conduit which has become so clogged shall be entirely freed from these accumulations or will be replaced. Screwed plastic or metal caps or turned

wooden plugs shall be employed to protect all open ends. Plugs of waste wood, paper, cotton or other fibrous matter shall not be used. All unused conduit entries shall be blanked off in an approved manner and where conduits terminate in adaptable boxes, all removable box covers shall be firmly secured to provide complete enclosure. If considered necessary by the Engineer-in-charge, the conduits shall be swabbed out by drawing swabs of rag through the conduit to remove moisture prior to any cables being drawn in.

All conduit installations must be completed and erected in their totality before they are wired and must be fully rewirable from outlets to distribution boards or trunking systems etc. to which they connect. No wiring of any part of the installation shall be commenced until instructions are received to do so by the Engineer-in-charge at such time as he is satisfied that the wiring will not be damaged due to building operations.

Conduits shall be installed so that they are self-draining in the event of ingress of moisture due to condensation or any other reason. A suitable drainage hole shall be drilled at the bottom of the lowest conduit box in every 9-meter of horizontal run. PVC bush of good quality shall be used in each conduit termination in a switch box, draw box, lighting fixtures and circular junction boxes.

Exposed conduits running above false ceilings shall be suitably clamped independently along with the dropped ceiling. Perforated straphangers or twisted attachment shall not be acceptable. In no case shall raceways be supported or fastened to other pipe for repair and maintenance. They shall be arranged symmetrically and in the most compact design, in no way unduly criss-crossing each other. Proper spacing shall be maintained when two or more conduits run side by side. The layout of the pipes shall be co-ordinated with other services if any. The junction boxes and conduits used in hazardous areas shall be flameproof type with cast iron construction complete with threaded covers. The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth conforming to the requirements by means of special approved type of earthing clamp efficiently fastened to conduit pipe in a workman like manner for a perfect continuity between the earth and conduit.

The conduit system shall be so laid out that it will obviate the use of tees, elbows and sharp bends. No length of conduit shall have more than the equivalent of two-quarter bends from inlet to outlet. The conduit itself being given required smooth bend with radius of bends suiting to the site conditions but not less than 6 times overall diameter.

Outlet boxes shall be of heavy-duty sheet steel installed as to maintain continuity throughout. These shall be so protected at the time of laying that no mortar finds its way inside during concrete filling or plastering. For fluorescent fittings, the outlet boxes heavy duty shall be provided 300mm off centre for a 1200mm fitting and 150mm off centre for a 600mm fittings or as per B.O.Q.

Draw boxes of ample dimensions shall be provided at convenient points to facilitate pulling of long runs of cables. They shall be completely concealed with MS covers flush with plasterwork painted to match the wall. These boxes will be as few as possible and located where found suitable by the consultant.

C. Switch Boxes:

The switch boxes shall be zinc passivated & shall not be less than **18 SWG** thick or shall be as called for in BOQ. It will be so designed that accessories could be mounted on integral pedestals or on adjustable flat iron mounting straps with tapped holes by brass machine screw. Leaving ample space at the back and on the sides for accommodating wires and check nuts at conduit entries. These shall be attached to conduits by means of check nuts on either side of their walls. These shall be completely concealed leaving edges flush with wall surfaces. Earthing terminal inside box shall be provided.

Moulded plate switches screw less as specified in item of work shall be provided. No timber shall be used for any supports. Boxes, which come within concrete, shall be installed at the time of casting. Care shall be taken to fix the box rigidly so that its position is not shifted while concreting.

D. Wiring:

All the wiring installation shall be as per IS: 732 with latest amendment. PVC insulated copper conductor cables as specified in bills of quantity shall be used for sub-circuit runs from the distribution boards to the points and shall be pulled into conduits. They shall be twisted copper conductors with thermoplastic insulations of 660/1100 volts grade. Colour Code for wiring shall be followed.

Looping system of wiring shall be used, wires shall not be jointed. Where joints are unavoidable, they shall be made through approved mechanical connectors with prior permission of the consultant. No reduction of strands is permitted at terminations. No wire smaller than 1.5 sq.mm shall be used and shall be as per B.O.Q. Wherever wiring is run through trunkings or raceways, the wires emerging from individual distributions shall be bunched together with cable straps at required regular intervals. Identification ferrules indicating the circuit and DB number shall be used for submains sub-circuit wiring. The ferrules shall be provided at both end of each submain and sub-circuit.

Where single-phase circuits are supplied from a three phase and a neutral distribution board, no conduit shall contain the wiring fed from more than one phase. In any one room in the premises where all or part of the electrical load consists of lights, fans and/or other single phase current consuming devices, all shall be connected to the same phase of the supply. Circuits fed from distinct sources of supply or from different distribution boards or through switches or MCBs shall not be bunched in one conduit. In large areas and other situations where the load is divided between two or three phase, no two single-phase switches connected to different phase shall be mounted within one box.

All splicing shall be done by means of terminal blocks or connectors and no twisting connection between conductors shall be allowed.

Industrial sockets shall be of moulded plastic BQQ and deeply recessed contact tubes. Visible scraping type earth terminal shall be provided. Socket shall have self-adjustable spring loaded protective cap. Socket shall have MCB/ELCB/RCCB as specified in the schedule of work.

Maximum number of PVC insulated 650/1100 V grade/copper conductor cable conforming to IS: 694-1990.

Conduit size	20mm		25mm		32mm		40mm		50mm	
	S	B	S	B	S	B	S	B	S	B
1.50	7	5	12	10	20	14	-	-	-	-
2.50	6	5	10	8	18	12	-	-	-	-
4	4	3	7	6	12	10	-	-	-	-
6	3	2	6	5	10	8	-	-	-	-
10	2	-	4	3	6	5	8	6	-	-
16	-	-	2	-	4	3	7	6	-	-
25	-	-	-	-	3	2	5	4	8	6

Notes:

- 1) The above table shows the maximum capacity of conduits for a simultaneous drawing in of cables.
- 2) The columns heads 'S' apply to runs of conduits which have distance not exceeding 4.25 m between draw in boxes and which do not deflect from the straight by an angle of more than 15 degrees. The columns heads 'B' apply to runs of conduit which deflect from the straight by an angle of more than 15 degrees.
- 3) Conduit sizes are the nominal external diametres.

7 DISTRIBUTION BOARDS & MCBs:

A. General:

Distribution boards shall be of standard make with MCBs as per approved make given. Distribution boards shall be constructed out of steel sheet all weld enclosure with double door IP42 protection and shall be powder coated. Ample clearance between the conductors of opposite pole, between conductors and sheet steel body shall be maintained in order to obviate any chance of short circuit. Removable conduits entry or knockouts plates shall be provided at top and bottom to facilitate drilling holes at site to suit individual requirements. Also on additional/separate adopter box of suitable length and size shall be provided to accommodate wires and cables. No. of conduits etc. and nothing shall be payable on this account. The MCBs shall be mounted on high-grade rigid insulating support and connected by electrolytic copper bus bars. Each incoming MCB isolator shall be provided with solderless cable sockets for crimping. Phase separation barriers made out of arc resistant materials shall be provided between the phases. Bus bars shall be colour coded for phase identification.

Distribution boards shall be recessed in wall nitch or if required mounted on the surface of the wall with necessary clamp bolts etc. The mounting height shall not exceed 1200mm from finished floor level. Distribution board shall be provided with proper circuit identification nameplate and danger sticker/plate as per requirements.

All the distribution boards shall be provided with engraved nameplates with 'lighting', 'power' or 'UPS' with DB Nos., as the case may be. Each DB shall be provided with a circuit list giving details of each circuit. All the outgoing circuit wiring shall be provided with identification ferrules giving the circuit number & phase.

Each distribution board shall have a separate neutral connection bar and a separate earth connection bar mounted within the DB each having the same number of terminals as the total number of outgoing individual circuits from the distribution board. Conduit & cable armouring shall be bonded together & connected to the distribution board earth bar.

Where oversized cables are specified due to voltage drop problems, it shall be contractors responsibility to ensure that satisfactory terminal arrangements are provided without an extra cost.

B. Earth Leakage Circuit Breaker:

ELCB shall be 4 pole 415 volts 50Hz, 30-300mA sensitivity. These shall be of approved make. The rating of the ELCB shall be as specified in BOQ. These

shall be suitable for manual closing and opening and automatic tripping under earth fault circuit of 30-300mA as specified in item of work. The enclosure of the ELCB shall be moulded from high quality insulating material. The material shall be fire retardent, anti-tracking, non-hygroscopic, impact resistant and shall with stand high temperature. All parts of switching mechanism shall be non-greasing, self-lubricating material so as to provide consistent and trouble free operation. Operation of ELCB shall be independent of mounting position and shall be trip free type. The RCCB shall be protected against nuisance tripping by protective device.

C. Miniature Circuit Breaker:

1. The MCB shall be current limiting type and suitable for manual closing and opening and automatic tripping under overcurrent and short circuit. The MCB shall also be trip free type.
2. Single pole/three pole versions shall be furnished as required.
3. The MCB shall be rated for 10 KA/15 KA fault level.
4. The MCB shall be suitable for its housing in the distribution boards and shall be suitable for connection at the outgoing side by tinned cable lugs and for bus-bars connection on the incoming side.
5. The terminal of the MCBs and the open and close conditions shall be clearly and indelibly marked.
6. The MCB shall generally conform to IS: 8828. -1996
7. The MCB shall have 20,000 electrical operation upto 63A.
8. The MCB shall have minimum powerloss (Watts) asper I.S./ IEC.

Renovation of Guest House in NIB, Campus Noida

List of Approved Makes of Materials

S.No	Details of equipment/ material	Make/Manufacturer
A-	CIVIL & Plumbing Services	
1.	Adhesive for Ceramic tiles	Cico / Pidilite / BalEndura / Sikka/ Laticrete
2.	Adhesive for Wood Work	Fevicol/Vamicol/Dunlop
3.	Aluminium Accessories and Hardware	Classic/Argent/Oxford/Nulite/Crown/EBCO /Earl Bihari
4.	Aluminium Extrusion/ Sections	Hindalco / Jindal / Indal
5.	Anchor Fastner	Hilti / Fischer /Bosch/ Canon
6.	Ball Cock	Sant / L&T/Audco/ Gpa
7.	Ball valves with floats	Zoloto / Leader / Sant / Jayco /GPA /Audco /AIP
8.	Brass stop & Bib Cock	Jaquar or equivalent
9.	Butterfly valves	Zolato/Audco / AIP /Sant/ KSB
10.	C. I Fitting	Electrosteel/ Kesoram/ Neco/ RIF
11.	C.I Sluice Valve & Non Return Valve	Kirloskar / IVC/ Leader /Zoloto/ Audco/ Sant/ AIP
12.	C.I Valves (Full way, Check and Globe Valves)	Leader / Kirloskar / SKF / Zolto / Sant / Upadhyay / Castle / Kartar
13.	C.I. Manhole Covers	Neco/R.I.F./B.C./Hepco/SKF/Kajeco
14.	C.P. Fittings Mixer / Pillar taps/ C.P brass angle valve/ Valves Washers, C.P. brass accessories	Jaquar or equivalent
15.	C.P. Waste, Spreaders, Urinal	Jaquar or equivalent
16.	Cement	ACC / Ultra tech / JK Cement / Jaypee-Rewa/ Ambuja/ Lafarge / Bangur/ Shree
17.	Cement: White	Birla White/ JK White
18.	Centrifugally cast C.I Rainwater fitting / Bronze gratings etc.	Sages Metals/ GMGR/ Electro Steel / Kesoram Neco / Neer
19.	Centrifugally casted C.I. Pipes	Neco / Hepco / Anand/ Kapilash
20.	CPVC Pipes & Fittings	Flowguard/ Astral/ Ashrivad / Prince
21.	Dash Fasteners	Hilti / Faischer /Bosch /Canon
22.	Door closer / Floor spring	Doorking / Everite / Hardwyn/ Master
23.	Door Locks	Godrej / Harrison / Link
24.	Doors & Windows Fixtures/ Fitting.	Everite / Classic/ Crown / Earl Bihari
25.	E.P.D.M Gaskets	Anand Reddiplex / Enviro Seals
26.	Flush Door Shutters	Duro / Greenlam / Century / Merino
27.	Flush Valves	Jaquar or equalvent
28.	G.I. Fittings	R/Unik/Zoloto/K.S.
29.	G.I. Pipes	Jindal (Hisar)/ Tata/ B.S. T
30.	Glass : Float & Mirror	Modiguard / Atul/ Saint Gobain/ Asahi India
31.	Gunmetal Valves/ C.P brass angle valve	Zoloto/ Leader/ Sant/ Audco

32.	Laminates/ Veneers	Century/Greenlam/Formica/Sunmica/Merino
33.	Liquid Soap Dispenser	Euronics/Utec/Kopal
34.	P.T.M.T. Fitting	Prince India / Symet / Prayag
35.	Paints - Cement Based	Snowcem Plus/, Berger (Durocem Extra)/ Nerolac (Super Acrylic)/ TATA Cem
36.	Paints - Epoxy paint	ICI Dulux/ Nerolac/ Cico/ Sikka/ BASF / Berger / Pidilite
37.	Paints - Oil Bound Distemper / Acrylic Washable Distemper	ICI Dulux/ Asian (Tractor)/ Berger (Bison)/ Nerolac (Super Acrylic)
38.	Paints - Other Paints / Primer	ICI Dulux/ Asian/ Berger/ Nerolac
39.	Paints - Plastic Emulsion Paint	ICI Dulux/ Asian/ Berger/ Nerolac
40.	Paints - Synthetic Enamel Paints	ICI Dulux (Gloss), Berger (Luxol Gold), Asian (Apcolite), Goodlas Nerolac (Full gloss hard drying)
41.	Paints - Texture paint	Berger / Spectrum / Unilite Heritage / Asian
42.	Paver blocks (All Types)	KK Manholes/ Uni Stone Products (India) Pvt. Ltd/ Hindustan Tiles
43.	PE-AL-PE Pipe and Accessories	Kitec/ Jindal/ Kissan/Vista
44.	Plastic seat cover of W.C	Commander/Hindware / Parryware
45.	Plywood/ Block board/ Ply board	Duro/ Greenply/ Century/ Kitply/ National / Anchor/ Merino
46.	Polyethylene Storage Tank	Sintex / Polycon/ Fusion
47.	PP-R Pipes (PN - 16)	Amitex Polymers Pvt. Ltd. / Prince/ Supreme
48.	Pre-coated Galvanised Steel Sheet	Tata BlueScope/ Llyod Insulations India Ltd / S.R.Metals
49.	Pre-Laminated Particle Board	Novapan /Century /Green Ply
50.	PVC continuous fillet for periphery packing of glazings / Structural/ Glazing	Roop/ Anand/ Forex Plastic/ Nagalia Trading Company
51.	PVC Doors	Sintex/ Polyex/ Rajshri
52.	PVC flushing cistern	Commander / Parryware / Hindware
53.	PVC Pipes & fitting SWR Soil, Waste & Vent Pipes and fittings, Type B PVC Casing & Screen Pipes	Prince / Supreme / Finolex
54.	PVC Water Stops	Prince /Supreme/ Finolex
55.	R.C.C Pipes	Indian Hume Pipe/ Pragati Concrete Udyog /ISI Marked Pipes/Daya/KK / JSP
56.	Reinforcement Steel / Structural Steel	SAIL/ RINL/ TATA Steel Ltd./ Jindal Steel & Power Ltd./ JSW Steel Ltd.
57.	SFRC/ RCC Manhole Covers/ Perfect RCC Grating	KK Manholes/ SK Precast Concrete/ Advent concretevision / Daya concrete
58.	SS Gratings, Soap Dish Towel Rail etc.	Jaquar /Camry/Glacier/Gem
59.	Stainless Steel	Salem Steel/ Jindal or as approved by EIC
60.	Stainless Steel bolts, Screws, Nuts & Washers	Arrow/Kundan/ Atul
61.	Stone ware pipes & Gully Traps	Perfect / SKF/ R.K/ Hind / Anand / Burn

62.	Submersible Drainage pump	Jyoti /Crompton/Kirloskar/ KSB /Grundfos/ Mather & Platt / JS/Wilo/ITT
63.	Tiles: Ceramic tiles	Kajaria/ Somany/ Nitco /HR Johnson
64.	Tiles: Glass Mosaic Tiles	Mridul / Bisazza/ Italias/ NITCO
65.	Tiles: Vitrified Tiles	Kajaria / Somany/ Marbonite / Euro
66.	UPVC Pipes & fittings	Finolex/ Prince/ Supreme/ AKG/ Kasta/ Vector / Astral
67.	Veneered Particle Board	Duro/ Greenply/ Century/ Novapan/ Action Tesa
68.	Vitreous China/ Sanitary ware	Hindware / Parryware / Cera
69.	Wooden Plank Flooring	Ego / Parquet /or equivalent
B-	Electrical Works	
1.	Ceiling fans	Crompton, Usha, Orient, Bajaj, Havells, GE, Khaitan, Alstom
2.	LED/ CFL lamps	Philips, Crompton, Wipro, GE, Osram, Bajaj
3.	Lighting Fixtures	Philips, Wipro, GE
4.	MCBs, RCCB & DBs	Legrand, Schneider, Siemens, GE, ABB, L&T (Hager)
5.	Exhaust fan	Usha, Crompton, Havells, GE, Bajaj, Alstom
6.	FRLS - PVC/ Aluminum/ copper 1.1 KV grade /cables & wires	Havells, Polycab, Finolex, RR
7.	PVC conduit & Accessories	Precision, Avonplast, Clipsal, Harsh, Polypack, BEC, AKG
8.	Hand Drier	Euronics, Jet India, Orchids or equivalent
Note:-		
<ol style="list-style-type: none"> 1. The contractor will use one of the approved makes as approved by NIB. 2. Makes other than specified above (if necessary) shall be approved by NIB. 3. All the items included in the list or otherwise to be used in the work should conform to CPWD and relevant BIS specifications/ relevant codes, as applicable. 4. If, any item is missing in the above list, its make will be decided by NIB. 5. The words “Equivalent” “Approved” and “Authorized” in the tender shall imply and require written approval of NIB. 		

END OF VOLUME -IV