



# **BANK OF MAHARASHTRA**

## **Financial Bid**

### **Electrification Work**

**Bank of Maharashtra  
Raipur Main Branch**

#### **OWNER**

**Asst. General Manager  
Bank of Maharashtra  
Regional Office  
Raipur (C.G.)**

### **Architects**

Architecture

**S. Nandedkar**

Interior

**& Associates**

Landscape Architecture

103, 'Utkarsha Umang', Near  
Mount Carmel School, Ajni Square,  
Nagpur (MS) India - PIN 440015

Project Management

**Tel: +91-712-2236945**

**Fax: +91-712-2243921**

**Cell: +91-98230 40281**

Consultant-Turnkey Projects

email: office@s-nandedkar.com

# **Financial Bid**

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## LIST OF APPROVED MATERIALS: FOR ELECTRICAL WORK

**NOTE:**

1. **No deviation permissible.**
2. Wherever Contractor proposes to use 'equivalent' makes (i.e. other than specified) the same shall be done only after prior approval from Architect. Any additional expenditure time due to this will be on Contractors account and no claims will be entertained.
3. All materials to be used shall be of first quality unless otherwise specified and as prescribed in Banks Standard Manual.
4. Contractor shall produce proof of purchase and use of the approved material as prescribed by the Architect, from the company/ manufacturer at the time of presenting running bill and the final bill.

S.No.	ITEM	MAKE
1.	Wires	V-Guard or as directed by Architect
2.	Cables	Suncab, Polycab
3.	6A switches & Sockets	NORTH-WEST or as directed by Architect
4.	Ceiling Roses, Holders, Buzzers, Bell Push, Bell	NORTH-WEST or as directed by Architect
5.	MCB's & accessories	L& T, Siemens or as directed by Architect
6.	Electrical fittings	WIPRO or as directed by Architect.
7.	Fans	Almonard, Bajaj - (High speed models) or as directed by Architect
8.	HRC switch fuse unit	E.E., L&T, siemens
9.	Bus- bar chamber	Standard, L& T
10.	Cable glands & Lugs	Siemens, Dowels
11.	15 A switch socket	NORTH-WEST or as directed by Architect
12.	16 A DP switches with Fuse	NORTH-WEST or as directed by Architect
13.	Telephone Wires	V-Guard or as directed by Architect
14.	Fluorescent tubes, bulbs	Wipro, Bajaj
15.	Electronic regulators	NORTH-WEST or as directed by Architect
16.	PVC conduits	Precision, Diamond
17.	Casing capping & Accessories	Precision, Modi
18.	G.I. "B" class pipe	Prakash, Surya

## SCHEDULE- B

Name of Work: Electrification work of Main Branch of Bank of Maharashtra, Raipur.

S. No	ITEM	UNIT	QTY	RATE Rs.	AMOUNT Rs.
(A)	<b>Light/Fan/Raw/Computer Point wiring</b>				
1a	Providing concealed light point on <b>wall/partition/for light/fan/bell</b> with ISI mark sheathed 2 x1.5sq.mm and 1x1sqmm for earth copper wire from switch to socket in 2 mm. thick PVC with <b>ISI mark modular switch</b> of approved make concealed M.S.box top plate and border. Modular Switch North West or as Directed by architect .( <b>Rate consider for one light by one switch</b> )	No.	62		
b	<b>Same as above</b> Two light by one switch	No.	2		
c	<b>Same as above</b> but 5 Amps. Switch & socket on common lighting switch board.	No.	9		
d	Providing concealed Raw Power point with ISI mark sheathed 2 x2.5sq.mm and 1x1.5sqmm for earth copper wire in 2 mm. thick PVC with ISI mark 6 A modular switch & Socket of approved make concealed M.S.box top plate and border. Modular Switch North West or as Directed by architect.	No.	9		
e	Providing concealed Raw Power point with ISI mark sheathed 2 x 4 sq.mm and 1x1.5sqmm for earth copper wire in 2 mm. thick PVC with ISI mark 16 A modular switch & Socket of approved make concealed M.S.box top plate and border. Modular Switch North West or as Directed by architect .	No.	7		
f	Providing & fixing open Light/fan point in PVC Casing Capping with 2x1.5 mm copper wiring & <b>Anchor Penta switch</b> , ms box & Hyalam plate. One light by one switch	NO	15		
g	Providing and fixing Modular type <b>5A 4 No.</b> of sockets with switches and suitable Modular plate/ms box concealed in wall/ partition for computer board in server room, CM's cabin, Accountant cabin.	No.	4		

S. No	ITEM	UNIT	QTY	RATE Rs.	AMOUNT Rs.
h	Providing and fixing Modular type <b>5A 3No.</b> of sockets with switches and suitable Modular plate/ms box concealed in wall/ partition for computer board.	No.	6		
2	<b>I.1 KV cables &amp; Cable termination</b>				
a	Providing laying & termination of <b>50.00 Sq.mm. 3.5</b> core armored Alu. Cable PolyCab or equivalent makes with 2x8 S.W.G. G.I. wire for mains incomer on wall with G.I.Saddles.As Directed by Architect	Rmt.	35		
b	Providing laying & termination of <b>10 sq.mm.x4.0</b> core around copper cable PolyCab or equivalent make with 1x8 S.W.G. copper bear wire from Sub-main and UPS input on wall with M.S.Saddles.As Directed by Architect	Rmt.	39		
c	Same as above <b>4Cx16Sq.mm copper</b> Armoured Cable including lugs & Gland for Mains To Busbar & DB	Rmt.	49		
d	Same as above <b>4Cx6Sq.mm copper</b> Armoured Cable including lugs & Gland for Lighting & Power DB	Rmt.	7		
3	<b>Earthing</b>				
a	Providing <b>earthing by using 600mmx600mm x 4mm</b> thick copper plate buried in specifically prepared earth pit 2.4m below ground with 50kg. Charcoal and salt with 19mm. Dia. G.I.pipe with funnel with a wire mesh for watering and brick masonry block C.I.cover complete as Para 7.3 of IS 3043-1966 with necessary length of 8sq.mm. double copper earth wire bolted with lug to the plate and covered in 15mm Dia GI pipe 2.5 mtr. long complete connected to the nearest switch gear with end socket as per direction and duly tested by the earth tester.	No.	2		
b	Providing laying & termination of <b>25x3mm</b> bear copper Strip on MS saddles from each pit to Wall surface	Rmt.	25		
c	Providing laying & termination of <b>8 SWG x 2 No.</b> bear copper wire in 20mm 1.5mm thick PVC pipe on saddles from Earth Strip point to out put UPS DB	Rmt.	15		

S. No	ITEM	UNIT	QTY	RATE Rs.	AMOUNT Rs.
d	Providing earthing by using 600mmx600mm x 6mm thick GI plate buried in specifically prepared earth pit 2.4m below ground with 50kg. Charcoal and salt with 19mm. Dia. G.I.pipe with funnel with a wire mesh for watering and brick masonry block C.I.cover complete as Para 7.3 of IS 3043-1966 with necessary length of 8sq.mm. double GI. earth wire bolted with lug to the plate and covered in 15mm Dia GI pipe 2.5 mtr. long complete connected to the nearest switch gear with end socket as per direction and duly tested by the earth tester.	No.	1		
e	Providing & fixing of 25x3mm GI Strip from earth pit to main Panel	Rmt.	20		
4	<b>Distribution Board &amp; Mains :- Supply, Installation, Testing &amp; Commissioning of Double Door IP 42 Powder Coted,surfase Mounted Type DB</b>				
a	Providing and fixing of 100 A. 4 Pole 36 KA MCCB with encloser of approved make along with distribution (.L&T Make)	No.	1		
b	Providing and fixing of 40 A./63 A 2 pole MCB of approved make with necessary enclosure for UPS Input and output.ABB,L&Tmake /As Directed by Architect	No.	4		
c	Providing and fixing For Raw Power ETPN DB 4 way D. Door ,Incomer -63A 4 Pole MCB -1 No, & Outgoing -25 A SP MCB -10No. ABB L&T make /As Directed by Architect	No.	1		
d	Providing and fixing 8 way DB with 6 No.4A. to 16 A SP MCB and 25 A isolator of approved make for UPS out put along with enclosure for I/P circuit. approved make ABB L&T As Directed by Architect	No.	2		
e	Providing and fixing 8 way DB with 6 No.4A.to 16 A SP MCB and 25 A isolator of approved make for lighting along with enclosure. approved make As Directed by Architect	No.	2		
f	Providing, fixing, testing & commissioning of 20A.2 Pin & earth ray roll plug & socket with 20/25A. SP MCB for the various 1.5Tr./2.0Tr. A.C. requirements	No.	2		
g	Providing and fixing 100 Amp Copper Busbar	No.	1		

S. No	ITEM	UNIT	QTY	RATE Rs.	AMOUNT Rs.
h	Providing and fixing <b>125 A/414V main switch</b> with HRC fuses for mains.(L&T Make.)	No.	1		
i	Providing and fixing <b>63 A/414V main switch</b> with HRC fuses at U.P.S. for input.(L&T Make)	No.	1		
5	<b>Mains &amp; Submains circuit wiring for Light/Raw/UPS/AC point</b>				
	Providing and fixing <b>bunch of wire</b> of various size & thickness are as follows with 1x2.5sq.mm.earth wire in 2mm thick PVC conduit pipe for U.P.S. to distribution board, lighting DB & lighting DB to switchboard, A.C.points, motor pump & water cooler etc. including floor/wall cutting & making the surface as it is complete & as directed by Electrical consultant.				
a	Do - as above but use in wire 2x6 sq.mm.	Rmt.	132		
b	Do - as above but use in wire 4x4 sq.mm.	Rmt.	95		
c	Do - as above but use in wire 2x4 sq.mm.	Rmt.	185		
d	Do - as above but use in wire 2x2.5 sq.mm.	Rmt.	320		
e	Do - as above but use in wire 2x1.5 sq.mm.	Rmt.	190		
6	<b>Lighting Fitting &amp; Fixtures :-</b>				
a	Supply, installation, testing, commissioning of indoor recessed mounting luminaire with Wide spread <b>mirror</b> optic with 3x36W CFL Lamp & HF ballast.( Cat <b>WVP24336 Wipro</b> make or as directed by Architect)	No.	6		
b	Supply, installation, testing, commissioning of indoor recessed mounting luminaire direct-indirect with acrylic diffuser mirror optic with 2x36W CFL Lamp & HF ballast.( Cat <b>WVP 79236 Wipro</b> make or as directed by Architect)	No.	1		
c	Supply , installation ,testing commissioning of indoor recessed mounting Down Lighter 1x13WCFLsatin Finish <b>GCP 10218 Wipro</b> make or as directed by Architect)	No.	22		

S. No	ITEM	UNIT	QTY	RATE Rs.	AMOUNT Rs.
d	Supply , installation ,testing commissioning of indoor recessed mounting Down Lighter 2x13 W CFLsatin Finish <b>WCP 42213Wipro make</b> or as directed by Architect)	No.	29		
e	Supply, installation, testing, commissioning of indoor Surface mounting luminaire with Wide spread reflector with 1x28WT-5 CE - Mark Tube Rod & HF ballast. <b>WIF 21128 Wipro</b> make or as directed by Architect)	No.	4		
f	Supply and fixing of Ding-dong bell of approved make along the necessary connections.	No.	2		
g	Supply and erecting <b>Ceiling fans</b> with double ball bearings and with condenser A.C. 230 V, 50 cycles of <b>1200mm sweep</b> complete erected in position, canopy and down rod up to 1500mm GI 'C' class(Approx.) in length in provided hook with necessary rubber bushing, clamps, nuts and bolts etc. <b>Cromton High-speed model or as directed by architect</b>	No.	16		
h	Supply & erecting of <b>Wall/Table-mounted fans</b> AC 250 V, 50 cycles of 300mm Sweep completed. Hispeed Polstar /Bajaj	No	1		
i	Supply & erecting of <b>Exhaust fans</b> AC 250 V, 50 cycles of 300mm Sweep completed. Almonard/ Polstar /Bajaj	NO	3		
j	Supply Fixing of LED Light	mtr	15		
7	<b>Tel system :-</b>				
a	Providing, <b>telephone point</b> with modular hack type switch socket on wall /partition with 4 pair telephone cable in 2mm thick PVC pipe with suitable concealed M.S.box, plate & border including wall cutting & making the surface as it is etc.complete.	No.	12		
b	Providing Extra <b>telephone circuit</b> wiring with 4 pair telephone cable with 2mm thick PVC pipe from EPABX to point including floor cutting & making the surface as it is etc. complete. <b>Note:-</b> Each circuit is from EPABX to point without looping (less 5m cable included in point item)approved make /As Directed by Architect	Rmt.	320		
8	Providing & fixing of A-Bolt for ceiling Fan	No.	16		
9	Providing & fixing of Step type Regulator.	No.	16		

S. No	ITEM	UNIT	QTY	RATE Rs.	AMOUNT Rs.
<b>B)</b>	<b>Air Condition Piping Work :-</b>				
1	Supply & fixing of <b>Copper Piping</b> ever and above Standard length with Insulation etc From In door Units to out door units.	Rft.	110		
2	Supply & fixing of <b>3 Core 4 Sq.mm. Copper Cable</b> Standard length In PVC Pipe From In door Units to out door units.	Rft.	110		
3	Supply & fixing of <b>Drain Piping</b> ever and above Standard Plumbing Quality & Heavy duty PVC Concealed Pipe etc.	Rft.	125		
4	Tiles Cutting KOTA Stone Type 300mm width & making surface as it is	Rft.	127		
	<b>TOTAL</b>				

**Date:**

**Place:**

**Signature & Seal of the Contractor**

**Abstract of Schedule B**

	<b>Schedule B</b>	<b>Amount in Rupees</b>
<b>1</b>	<b>Schedule B for Electrification Work</b>	
	<b>Final Total Amount Put to Tender</b>	

**Total Amount Put to Tender (in Words):**

**Signature & Seal of the Tenderer**

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**FOR OFFICE USE ONLY**

## SAFETY CODE

### **Scaffolds**

i) Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except in case of short duration work which can be done safely from ladders. When a ladder is used, it shall be rigid construction made either for good quality wood or steel. The steps shall have a minimum width of 450 mm and a maximum rise of 300 mm. Suitable hands hold of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than 1/4 to 1(1/4 horizontal and 1 vertical).

ii) Scaffolding or staging more than 4 m. above the ground floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly bolted, braced or otherwise secured at least 1m. above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying away from building structure.

iii) Working platform, gangway and stairway shall be constructed that they do not sag unduly or unequally and if the height of platform, gangway or stairway is more than 4m. above the ground level or floor level, they shall be closely boarded and shall have adequate width and be suitably fenced as described in (ii) above.

iv) Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 1m.

Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signals installed at nights so as to prevent persons slipping into the excavation.

v) Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m in length while the width between side rails in rung ladder shall in no case, be less than 290 mm. For ladder up to and including 3 m in length. For longer ladder the width shall be increased at least 20 mm for each additional meter of length.

vi) A sketch of ladder and scaffolds proposed to be used shall be prepared and approval of engineer obtained prior to construction.

### **OTHER SAFETY MEASURES.**

vii) All personnel contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding works and all metal worker shall be provided with safety gloves.

viii) Adequate precaution shall be taken to prevent danger from electrical equipment. No material on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

### **Excavation and Trenching.**

ix) All trenches, 1.25 m or more in depth shall at all times be supplied with at least one ladder for each 30 m in length or fraction thereof. The ladder shall be extended from the bottom of the trench to at least 1 m above the surface of ground. Sides of trenches which are 1.5 m or more in depth shall be stepped back to give suitable slope or securely held by timber bracing so as to avoid the danger of sides

collapsing. The excavated material shall not be placed within 1.5 m of the edges of the trench or half of the depth of trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

x) The contractor shall make all measures on the site of the work to protect the public from accidents and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought by any person of injury sustained owing to neglect of the above precautions and to pay any such persons or which may with the consent of contractor, be paid to compromise any claim by any such persons.

#### **Demolition**

xi) Before any demolition work is commenced and also during the process of work:

a) All roads and open areas adjacent to work site shall either be closed or suitably protected.

b) No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.

c) All practical steps shall be taken to prevent danger to person employed from the risk of fire or explosion or flooding. No floor, roof or other part of building shall be so overloaded with debris or material as to render it unsafe.

#### **Personal Safety Equipments**

xii) All necessary personal safety equipment as considered adequate by the Engineer should be kept available for use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor shall take adequate steps to ensure proper use of equipment by those concerned.

a) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

b) Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to eyes shall be provided with protective goggles.

c) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

d) Those engaged in welding works shall be provided with welder's protective eyesight lids.

e) When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manhole and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public.

f) The Contractor shall not employ men below the age of 18 years and women on the work of painting with product containing lead or any toxic material in any form. Wherever men above the age of 18 years are employed on the work of such painting the following precaution should be taken;

i) No paint containing lead or lead product shall be used except in the form of paste or ready made paint. Paint like vinyl and epoxies having toxic fumes should be applied after following precaution laid down by manufacturers.

ii) Suitable facemask should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

iii) Overall shall be supplied by the contractor to the workman and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.

xiii) When the work is done near any public place where there is risk of drowning all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

### **Hoisting Machines (If applicable)**

xiv) Use of hoisting machines and tackle including their attachment, anchorage and supports shall confirm to the following standard or conditions;

1. a) These shall be of good mechanical construction sound material and adequate strength and free from patent defect and shall be kept in good repair and in good working order.

b) Every rope used in hoisting or lowering materials or as means of suspension shall be of durable quality and adequate strength and free from patent defect.

2. Every crane driver or hoisting appliances operator shall be properly qualified and no person under the age of 21 years shall be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

3. In case of every hoisting machine and of every chain hook ring, shackle shovel and pulley block used in hoisting or as mean of suspension the safe working load shall be ascertained by adequate means. Every hoisting machines and all gear referred to above shall be plainly marked with safe working load. In case of a hoisting machines having a variable safe working load , each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

4. In case of departmental machines, the safe working load shall be notified by the engineer. As regards contractor's machines, the contractor shall notify the safe working load of the machine to the Engineer whenever he brings any machinery to site of work and get it verified by the Engineer concerned.

xv) Motors, gearing, transmission, electric wiring and other dangerous part of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum of the risk of any part of suspended load becoming accidentally displaced. When workers are employed on electrical installation which are already energized, insulating mats, wearing apparels, such as gloves, sleeves and boots as may be necessary, should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

xvi) All scaffolds, ladders and other safely devices mentioned or described herein shall be maintained in safe conditions and no scaffold, ladder or equipment shall be altered or removed while it is in use.

Adequate washing facilities should be provided at or near places of work.

xvii) These safety provisions should be brought to the notice of all concerned by display on notice board at a prominent place of work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

xviii) To ensure effective enforcement of the rules and regulation relating to safety precautions the arrangements made by the contractor shall be open to inspection by the labour officer, Engineer of the Department or their representatives.

xix) Notwithstanding the above clause from (i) to (xviii), there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

**MODEL RULES FOR THE PROTECTION  
OF HEALTH AND SANITARY  
ARRANGMENTS FOR WORKERS**

**Application**

These rules shall apply to all building and constructions works in charge of (Name of the projects).

**Definitions**

2. a) "Workplace" mean a place at which, at an average 50 workers are employed in connection with construction work.

b) "Large Workplace" means a place at which average 500 or more workers are employed in connection with construction work.

**First Aid.**

3.a) At every workplace, there shall be maintained in readily accessible place first aid appliances including an adequate supply of sterilized dressings and sterilized cotton wool. The appliance shall be kept in good order and in large work place they shall be placed under the charge of a responsible person who shall be readily available during working hours.

b) At large work places, where hospitals facilities are not available within easy distance of works, first aid posts shall be established and be run by a trained compounder.

c) Where large work places are remote from regular hospitals, an indoor ward shall be provided with one bed for every 250 employees.

d) Where large work places are situated in cities, towns in their suburbs and no beds are considered necessary owing to the proximity of city town hospitals, suitable transport shall be provided to facilitate removal of urgent cases to the hospitals.

At other work places, some conveyance facilities, such as car, shall be kept readily available to take injured persons or persons suddenly taken ill to the nearest hospitals.

**Drinking Water**

4. a) In every work place, there shall be provided and maintained at suitable places easily accessible to labour sufficient supply of cold water fit for drinking.

b) Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

c) Every water supply of storage shall be at a distance of not less than 15 meter. From any latrine, drain or any other source of pollution. Where water has to be drawn from an existing well which is within the proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated water is drawn from it for drinking. All such well shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.

d) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

### Washing and Bathing Places

- 5 a) Adequate washing and bathing places shall be provided, separately for men and women  
b) Such places shall be kept in clean and drained condition.

### Scale of Accommodation in Latrines and Urinals.

6. There shall be provided within the precincts of every work place latrines and urinals in an accessible place, and the accommodation, separately for each of them shall not be less than the following scale.

Sr. No.		No. of seats
a)	Where the number of persons does not exceed 50	2
b)	Where the number of persons exceed 50 but does not exceed 100	3
c)	For every additional 100	3 per 100

In particular cases, the Engineer shall have the power to vary the scale where necessary.

### Latrines and Urinal for women

7. If women are employed, separate latrines and urinals screened from those for men and marked in the vernacular in conspicuous letters For Women Only shall be provided on the scale laid in rule 6. Those for men shall be similarly marked For Men Only. A poster showing the figure of a man or a woman shall also be exhibited at the entrance of latrines for the respective sex. There shall be adequate supply of water close to the urinals and latrines.

### Latrines and urinals

8. All latrines shall be provided with septic tanks or leach pits in case of small unit. All the latrines shall be kept in good sanitary condition.

### Construction of Latrines

9. The inside wall shall be constructed of masonry or some suitable heat resisting non absorbent materials and shall be cement washed inside and outside at least once a year. The dates of cement washing shall be noted in a register maintained for this purpose and kept available for inspection. Latrines will not be of a standard lower than borehole system and should have thatched roofs.

### Disposal of Excreta

10. Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta shall be made by septic tank or leach pit duly approved by the Engineer and in conformity with the requirements of local public health authorities.

### **Provision of Shelter during Rest**

11. At every work place there shall be provided free of cost, two suitable shades, one for meals and the other for rest separately for man and women for the use of labour. The height of shelter shall not be less than 3.5m from the floor level, to the lowest part of the roof. The sheds should be roofed with at least thatch and mud flooring will be provided with a dwarf wall around not less than 750mm. The sheds should be kept clean and the space should be the basis of at least 0.50sq.m.per.head.

### **Crèches**

a) At every work place at which 50 or more women workers are ordinarily employed, there shall be provided two huts for the use of children under the age of 6 years belonging to such women, one hut shall be used for infants games and play and the other as their bedroom. The huts shall not be constructed on a lower standard than the following:

- i) Thatched roof
- ii) Mud floors and walls
- iii) Planks spread over the mud floors and covered with matting.

The huts shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the place clean. There shall be two dais in attendance. Sanitary utensils shall be provided to the satisfaction of the Health Officers of the area concerned. The use of the hut shall be restricted to children, their attendants and mothers of the children.

b) Where the number of women workers is more than 25 but less than 50, the contractor shall provide at least one hut and one dais to look after the children of the women workers.

c) The size of crèche or crèches shall vary according to the number of women worker.

d)The crèche or crèches shall be properly maintained and necessary equipments like toys, etc. shall be provided.

### **Canteen**

13. A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered expedient.

14. The above rules shall be incorporated in the contracts and in notices inviting tenders shall form an integral part of contract.

## ELECTRICAL WORK TECHNICAL SPECIFICATIONS

### General :

1. The entire installation shall be carried out in accordance with Indian Electricity code and relevant IS standards up to date. The work shall also comply with all statutory regulations of supply agencies, state inspection authorities and fire regulations.
2. Contractor shall be responsible all necessary statutory approvals, clearances, sanctions, drawing approvals and getting actual connections.
3. Definition of terms pertaining to all technical requirements as per IEE/ IS shall apply.
4. Contractor shall submit all necessary drawings for scrutiny and approval by Engineer/ Consultant prior to taking up of works. Contractor shall immediately bring out the difficulties faces in execution of works to the notices of Engineer/ Owner/ Consultant.
5. All material, equipment, fittings used in the installation shall be of approved quality confirming of relevant IS specifications.
6. On completion of works contractor shall carry out all necessary tests such as insulation resistance test, continuity of conductors and earth resistance and functional tests along with commissioning checks to the satisfaction of Consultant/ Engineer.
7. Contractor shall furnish necessary test certificates as required by authorities and Consultant.
8. List of IS standards is attached separately.

### LIST OF STANDARD

01. IS 4648 Code of practice for Electrical layout in Residential Buildings.
02. IS 7320 Electrical wiring Installations (System Voltage not exceeding 650 V)
03. IS 2274 Electrical wiring Installations (System Voltage not exceeding 650 V)
04. IS 3043 Code of practice for earthing.
05. IS 2809 Code of practice for lightning protection.
06. IS 1913 General and safety requirements for electrical lighting fixtures.
07. IS 5319 Guide for safety procedures and practices for electrical work.
08. IS 2268 Electrical call bells and buzzers.
09. IS 3412 Electrical water boilers.
10. IS 2882 Storage type Automatic water Heaters.
11. IS 1646 Protection for Fire safety of building Electrical installation.
12. IS 5908 Electrical Installation in Building Method of measurement.
13. IS 694 Specification for PVC insulated cables for working Voltages up to and including 1100 V.
14. IS 1554 Specification for PVC insulated cables for working Voltages up to and including 1100 V.
15. IS 3961 Recommended current ratings for cables PVC insulated and sheathed.
16. IS 2147 Degree of protection.
17. IS 4237 General requirement for Switchgear and control gear for Voltages not exceeding 1000 VAC and 1200 V.D.C.
18. IS 10118 Code of practice for selection, installation and maintenance of swgr and control gear.
19. IS 8623 Specification of factory built assemblies of switchgear and control gear for voltages up to and including 1000 V AC & 1200 V AC.
20. IS 3106 Code of practice for selection, installation and maintenance of fuses (Voltages not exceeding 600 Volts.)
21. IS 2551 Danger Notice Board.
22. IS 1886 Code of practice for installation and maintenance of transformers.
23. IS 1160 Distribution Transformers.

- 24. IS 2026 Power Transformers.
- 25. IS 3639 Fittings and Accessories for Transformers.
- 26. IS 6600 Transformer Oil.
- 27. IS 335 Bushing 100 AC.
- 28. IS 3637 Buchholz's Relay.
- 29. IS 7421 Bushing 100 V AC.
- 30. IS 1271 Electrical Insulation for Thermal Rating.

### **M.V.PANELS AND DISTRIBUTION BOARDS**

#### **1. CONSTRUCTION :**

The panels shall be free standing, floor mounting compartmentalized cubicle type panels with framed structure and bottom channel frame of suitable section. The frame structure shall be rolled/ folded sheet section of 2.0 MM thick sheet. Partitions shall be 1.6 MM thick. The panel shall be dust and vermin proof with neoprene gasketing. Following minimum clearances shall be adhered to while such designs.

- A. Between phases : 35 MM
- B. Between Phases & Neutral : 25 MM
- C. Between Phases & Earth : 25 MM
- D. Between Neutral & Earth : 25 MM

All installation materials used for supports shall be non-hygroscopic duly treated to withstand high humidity, tropical conditions and stresses due to temperature variations. The panels shall be so designed to provide sufficient space for cable alleys for incoming cables. Removable gland plates shall be provided. Shrouding with Hylum sheet shall be provided for all compartments and live parts such that no live part is exposed directly on opening any door.

## **2. CLEANING AND PAINTING:**

The fabricated sections shall be thoroughly cleaned by 7 tank process which includes alkaline degreasing, cold water rinsing, acid pickling, water rinsing, phosphating and passivation. Panels shall then be painted with 2 coats of corrosion resistant primer and oven dried under controlled conditions.

Then 2 coats of stoving enamel paint of approved shades shall be given.

## **3. BUSBARS :**

The bus bar unless otherwise specified shall be of high conductivity aluminum alloy of grade E9 per IS 5082. The bus bar shall be provided with suitable SMC bus bar support suitable for withstanding fault level up to 50 KA. The bus bar shall also withstand above fault level without permanent deterioration. The connections shall be securely done with adequate size of plated hardware plate and spring washer sets. The inter connections shall be made with solid bus bars as far as possible. Bus bars shall be provided with colour coded PVC sleeves.

## **4. SWITCHGEAR :**

The switchgear used in panels shall be pertaining to relevant IS standards and shall be from the approval list. The terminals shall be suitable for accepting bus bars and cables of relevant sizes suiting the switchgear rating. The metal parts other than live contacts shall be treated against corrosion. All switches shall be with door interlocked provision.

## **5. MEASURING INSTRUMENTS AND INSTRUMENT TRANSFORMER :**

Direct reading instruments shall be in confirmation with IS 1248 and of accuracy class 1.0. All meters shall be flanged mounting type with minimum 96 X 96 MM size and in dust proof enclosures. The

meters shall have white dials with black scales. All meters shall have sealing arrangement and zero adjustment secure from outside.

Voltmeters and ammeters shall be moving iron type with suitable selector switches and protective fuses for potential circuits.

The current transformers shall be single pole wire wound resin cast accuracy class 1.0 for metering and 5p for protection. Separate CT's shall be provided for metering and protection. The polarities shall be prominently marked CT circuits shall be wired with 2.5 Sqm. multistrand copper wires. CT's shall not be kept open and terminal-shortening arrangement shall be provided.

#### **6. INDICATION AND CONTROL :**

The control switches shall be rotary type with suitable isolation transformer provided for control supply. Control supply bus shall be provided wherever necessary. Indicating lamps shall be translucent lamp covers and with arrangement to replace bulbs from front. Push buttons shall be momentary contact. Type with suitable color cod and shall be fitted with integral marker plate.

The control wiring shall be with 1.5 Sqm. multistrand 1100 V gr copper wire except CT Circuit, which shall be with 2.5 Sqm. wires. Identification ferules and color coding shall be used for all wire control fuses shall be provided wherever required. The control wires shall be bunched and traced properly and shall not be left hanging.

#### **7. DISTRIBUTION BOARDS :**

The distribution boards shall generally be as per panel specification above. All DB's shall be MCB type suitable for concealed/ surface installation. DB's shall be factory made vertical type with hinged secured front covers, knob protection cover, top and bottom knock outs, earthing studs circuit marking provisions.

The DB shall be completed pre wired with necessary bus bars interconnecting terminals, neutral bus.

The MCB's shall conform to IS 8828 and shall have 9 KA breaking capacity.

#### **8. INSPECTION AND TESTING :**

Inspection and testing for all panels as per IS Standard shall be offered to consultant/ owner's representatives.

### **CABLES AND CABLE LAYING**

#### **A) H. T. CABLES :**

- i) The H.T. cables shall be XLPE insulated of appropriate voltage class sheathed, armored multistrand aluminum conductor manufactured in accordance with S 7098 part IS II
- ii) The cables shall be supplied with non-returnable wooden drums in appropriate lengths and shall be free from twists and surface damages.
- iii) The ends of the cables shall be properly sealed and secured so as to avoid water seepage during transit and storage.
- iv) The cables shall be laid at a depth of 1000 MM minimum and shall have 75 MM sand cushion brick box and top RCC protective tile marked "H.T. cables" of size 600 X 225 MM.
- v) Cables shall be laid with the help of jacks and rollers to avoid dragging and twisting. Sufficient loops shall be provided at ends and in center.
- vi) Cables shall be supported with protective pipes and clamps on vertical runs and shall be laid through appropriate pipes for road and gutter crossings.
- vii) Heat shrinkable/ push on jointing kits of reputed makes shall be used for indoor/ outdoor end terminations. Heat shrinkable boots shall be provided for bushing connections.

#### **B) L. T. CABLES. :**

All power and distribution cables shall be 1100 V grade, PVC insulated and sheathed armored, multi strand aluminum conductor cables unless otherwise specified.

All control cables shall be 1100 V grade PVC insulated and sheathed armored – multi strand copper conductor cables unless otherwise stated.

The cables shall conform to IS 1554-1976 with up to date amendments. Type test certificates of the cables from manufacturers for the particular drums shall be provided.

#### **LAYING :**

The cables shall be thoroughly inspected for transit damage and irregularity in sheath etc.

- i) Sufficient manpower with necessary equipment like jacks, rollers shall be provided for unwinding and laying the cables and dragging and twisting shall be avoided. Proper unwinding methods shall be used to avoid twists.

- ii) Cables shall be laid at a depth of at least 750 MM foreground level with 50 MM sand bedding, brick box with cushion for protection. Bending radius provision of at least 8 D shall be kept while laying. The trenches shall be filled and reinstated layer by layer leaving crown on top.
- iii) H.T. & L.T. cables shall be laid in same trench. When more than one cable are laid in same trench a gap of at least 150 mm shall be kept between the cables.
- iv) Cables laid on walls, trenches shall be supported at every 600 MM for vertical run and every 450 MM for horizontal run. Suitable clamps shall be provided for fixing and support. Vertical runs near ground level shall be protected by GI Pipes of suitable size up to at least 1200 MM.

#### **JOINTING :**

Jointing or end termination of cables shall be done by skilled person only. Straight through joints shall be avoided as far as possible. The length of the cables are approximate and actual site measurements shall be taken by contractor prior to cutting any cable. Heavy duty compression type brass shall be used for outdoor connections. Crimping type lugs with suitable brass hardware shall be provided for connections.

#### **TESTING :**

Cables shall be meggered as soon as they are brought to site. Insulation resistance shall also be tested.

- i) After cutting.
  - ii) After laying and preparing the joint.
- Following test shall be taken after completing the installation
- a) Cable continuity.
  - b) Earth continuity.
  - c) Insulation resistance.

1000 V megger shall be used for testing 3-phase 415-volt system.

#### **POINT WIRING**

##### **1. CONDUITS: ACCESSORIES AND JOINTS :**

All conduits shall be HG MS conduits 165 WG up to 25 MM dia and 145 WG above size. All conduit accessories shall be screwed type and conduits shall be joined by means of threaded coupling only. Check nuts shall be provided at all joints for tightening and sealing. Ends of conduits shall be coated with plastic adhesive.

All conduits and accessories shall be painted with 2 coats of Red Oxide before installation and accessible parts of conducting after installation shall be painted with enamel paint to match the wall paint. Capacity of conduits is separately given. In case of rigid PVC conduits, the conduits shall be made using special adhesives used for pressure pipe joints.

##### **2. SURFACE CONDUITING:**

The surface conduits shall be fixed with help of 20 SWG saddles on spacers at every 600 MM for vertical run and every 450 MM for horizontal run. The runs shall be straight with suitable sleeves for structural member crossing at the time of costing.

In case of false ceiling the conduits shall run on walls/ trusses above false ceiling level as far as possible. The connections between such runs and fixtures shall be made with flexible conduits.

### **3. CONCEALED CONDUITING :**

the concealed conduit work shall be carried out along with construction of walls prior to plaster. The work covers chasing walls if necessary fixing the conduits, boxes, accessories, redoing the damaged surface. The conduits shall be laid such that they are little below the brick level to avoid cracks. Elbow shall not be used and bends shall be avoided as far as possible using offsets. Pull boxes shall be provided at suitable locations. Deep junction boxes only shall be used in slabs.

The pull and junction boxes shall not be clustered at one place and shall be so arranged that they should not be easily seen from heavy movement areas. All cases shall be taken to secure joints and boxes in place. All vertical runs shall be sealed at top.

### **4. SWITCH BOARDS :**

The switchboards unless specified in item shall be MS fabricated from 16 SWG sheet steel with all sides except top. Top plate fixing arrangement shall be provided at all corners with tapped holes. At least 1 No. earth stud shall be provided. Switchboard shall be at least 60 MM. Deep. Switch board shall be painted with 2 coats of Red Oxide primer from inside and outside. In case of surface mounted boards 2 coats of enamel paint of suitable shed shall be given to accessible sides.

The switch plate shall be 2 MM thick while phenol bonded sheet unless specified and shall be fixed with completed screws with cap washers.

### **5. SWITCH & SOCKETS :**

All 5/15 a switches shall be piano type 240 V grade of approved color and of same shed throughout. 5A Sockets shall be 3 pin and 15 SMP sockets shall be 5 pin (Universal). All switches shall be provided one phase wires only. For power points more than 10 AMP capacity 30 AMP flush type DP switches shall be provided.

### **6. WIRES AND WIRING INSTALLATION:**

All wiring shall be carried out with PVC insulated, 1100 V grade multi strand copper conductor wires of specifies sizes.

The conduits shall be ventilated and drained before drawing the wires.

He circuit wires shall be laid in looped formation with suitable termination arrangement in junction boxes.

T joints shall be used. No joints shall be allowed in drawn lengths. Crimping type lugs shall be used for switch interconnections. Color codes shall be followed :

Separate earth wire of same class and suitable size shall be drawn along with other wires. Mains and sub mains shall be drawn in separate conduit of adequate capacities with separate earth wires. All circuit wires shall be meggered for continuity and insulation resistance.

#### 7. WIRING CLASSIFICATION :

- i) Lighting Sub Mains : 2\*2.5 + 1\*1.5 Sqm. wires.
- ii) Light/ Fan/ 5A/ Ex Fan Pts. : 2\*1.5 + 1\*1.5 Sqm. wires.  
Call Bell
- iii) 15 A Point : 2\*2.5 + 1\*1.5 Sqm. wires.
- iv) As above but looped : 2\*4.0 + 1\*2.5 Sqm. up to 1<sup>st</sup> point.  
2\*2.5 + 1\*1.5 Sqm. for Looped point.
- v) 1 Tone window A/A & 20A : 2\*4.0 + 1\*2.5 Sqm wires.  
Power Point.
- vi) Window A/C 1.5 Tone : 2\*6.0 + 1 \*2.5 Sqm. wires.  
Geyser & 30 AMP Pts.

#### 8. CONDUIT CAPACITIES :

WIRE SIZE	1.5	2.5	4.0	6.0	10.0
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## CONSUIT SIZE

19/20 MM	4	3	--	--	--
25 MM	5	4	3	2	--
32 MM	8	6	4	4	3
40 MM	12	8	6	5	4

## 9. MOUNTING HIGHTS (ABOVE FFL) :

- i) Light Points on Walls : 2250 MM.
- ii) Switch boards DB's : 1200 MM
- iii) Socket outlets : 1200 MM/ 300 MM
- iv) Telephone Sockets : 130 MM
- v) Geyser outlets : 1500 MM.
- vi) Exhaust Fan outlet : Switch at 1200 MM Socket near Ex. Fan.
- vii) A/C Point : Bellow window sill / Near A/C Equipment.

## 10.00 POLISHING

The surface shall be free of dirt and dust etc. and sand papered to a smooth surface. The polish shall be prepared with spirit and approved quality acrylic. The surface shall be prepared and all holes, cracks shall be filled to form a truly even surface. For white cedar, approved quality of white shall be used to polish. The polishing of the exposed surface shall be done with minimum three coat of spirit polish with immediate sand papering after each coat of polish. It shall be finished to the entire satisfaction of the Architect and a final coat of 'Mansion Wax' polish shall be applied and the surface be finished. For insides of cabinets and drawers, the polish shall be done in two coats. The undersides of the table tops shall be finished with one of polish. All samples of polish shall be approved by the Architect and shades / colour shall be matched properly wherever necessary.

## 11.00 ADDITIONAL SPECIFICATION

All woodwork which is not visible will be painted with approved fire retardant paint with resistant properties ( Viper or equal) as per manufactures specifications. This shall be done before it is installed in position. No covering over the timber is permitted till the timber is checked and certified by the Engineer-in-charge.

All steel work shall be painted with one coat of primer and two coat of first quality enamel paint of approved make. The priming coat shall be done before installation.

Painting and Finishing shall be carried out on wood and steel as described in description of items whether specifically or not in the item shall be done by the contractor without any extra cost.

#### **12.0 MANDATORY TEST**

10.1 The contractor is required to carry out test for different materials and items as per CPWD specification and IS Code from a reputed test house and no extra shall be paid on this account.

#### **13.0 WATER & ELECTRICITY**

11.1 The contractor shall arrange water and electricity at his cost as required to carry out the work no extra payment will be made for the same.



Dwg Title: ELECTRICAL LAYOUT

PROJECT: **INTERIOR WORK of MAIN BRANCH**

ARCHITECTS: **S.NANDEDKAR & ASSOCIATES**

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FOR: **BANK OF MAHARASHTRA, RAIPUR Region**

103, 'UTKARSHA UMANG' Appts. near MOUNT CARMEL School, AJNI SQUARE, NAGPUR.  
TEL - (712) 2936945, FAX (712) 2943921

