# INDIRA GANDHI INSTITUTE OF MEDICAL SCIENCES:

# SHEIKHPURA: PATNA-14

**(Tender documents)**

**Institute web site : www.igims.org**

01. Sealed item rate quotation tender from the registered contractor in C.P.W.D., E.W.D, P.W.D., under the appropriate class to be eventually drawn in the prescribed format of the details of items will be received up to 04.00 P.M on 01-07-2013 by Speed**/Registered Post, / Currier only** in the **office of the Director, I.G.I.M.S., Patna**-14, for the work as mentioned above and will be opened on 03-07-2013 at 3.30PM in presence of the tenderer or their authorized representative

02.The details of items may seen and down loaded from the Institute web site **www.igims.org** The cost of the tender non refundable is required to deposit along with the "Technical bid " of the tender by the tenderer in the shape of Bank Draft in favor of the ***Director, I.G.I.M.S., Sheikhpura, Patna-14*** **(Bihar),** for the work as specified as above and to be furnished along with their quotations tender **otherwise the tender may out be right rejected.**

03.The tenderer is required to deposit the Earnest Money amount in the shape of Bank Draft in favor of the ***Director, I.G.I.M.S., Sheikhpura, Patna-14*** **(Bihar)**

04**.** Quotation documents without cost of the document and/or Earnest Money or insufficient Earnest Money will out right rejected and there will be no position on the body of comparative statement.

05Details of amount deposited against cost of the quotation documents and earnest money:-

**.a. Cost of quotation document:-**

D.D. no. …….

Date……..…Amount……

**b. Earnest Money**: -- D.D. no. ……..

Date……..……Amount……

**(**The rate should be written in figures as well as in words in such way that interpretation possible.)

06. Tenderer shall quote their rates in given format. of details of items

07. The rate quoted by the contractors should be inclusive of all taxes, royalty and other incidental charges what so ever.

08 The contractor should satisfy them-selves full about the nature and

site of work before offering their tenders and plea of any ignorance afterwards will not be considered. The tenderer should acquaint themselves with the work and working conditions of the site and no claim will be entertained on the issue

09. Contractors are required to furnish up to date tax clearance certificate in respect of Income Tax and Sales Tax along with their tender. In absence of these documents along-with liabilities certificate from Income Tax and Sales Tax Departments within ten days from the date of asking in Registered Letter with acknowledgement, failing which their tenders shall be out-right rejected and their Earnest Money with tender, shall be stand forfeited, without any further intimation.

10. Contractors are required to furnish the certified copy of License issued by the Labor Department for engaging labor, in contract job and Character Certificate issued by the District magistrate/ Superintendent of Police is also to be furnished. Certified copy of the certificate issued / obtained for carry out the electrification work ( electrical Contractor license ), and supervision of the electrical work ( Electrical Supervisory License ) and doing the internal electrification work ( wireman certificate ) from the Electricity Department, Government of Bihar are essential to be furnished.

11.After approval of rates by the competent authority the contractors shall have to deposit in the form of the initial security money, amounting to @ 05% of the value of the

order of work, deducting the amount already deposited in the form of earnest money, in shape of Bank Draft, drawn in favor of the Director, I.G.I.M.S., Sheikhpura, Patna-14 (Bihar), on receipt of written orders from the Superintending Engineer / Electrical Executive Engineer, I.G.I.M.S., Patna-14 and execute the agreement, failing which his tender shall be rejected and Earnest Money forfeited.

12. Conditional tenders may be out-righting rejected.

13. Authority shall reserve the right to reject any or all tenders or distribute the work to more than one contractor without assigning any reason.

14. No claim for ideal labors due to shortage of work, non-supply of materials, drawing and design or any other reason shall be entertained.

15. Contractor shall arrange site for accommodation and other facilities

like medical aid, etc, for the labor at his own cost and initiatives as well as comply with the labor rules, prevalent in the locality.

16. The contractor shall be solely responsible for any damage or loss in public property due to negligence of his labors or other staff and shall be made good at his own cost.

17. C.P.W.D. /PWD /EWD /, Energy (Electricity) department, Govt. of Bihar & I.S.I specifications shall be followed during the process of work. In case of any difference of opinion on any of these, directions of the Electrical Executive Engineer have to be followed.

18. No claim shall be entertained due to fluctuation in rates of labor and materials at any time during completion of work.

19.( i). Institute materials may be issued to the contractor for confide use in the work allotted to him as per availability in stock on proper hand receipt and issue of rates specified in agreement.

(ii).Materials actually consumed in the work be calculated on the basis of approved design and specification and or laboratory test. The materials received by the contractor, in excess of actual consumption as determined above, will be charged at panel rates, which will be double of the issue of materials.

20.The contractor employing trucks for carriage of materials or for other works shall comply the rules of Motor Vehicle Act.

21.It will be obligatory on the part of tenderer to keep the tenders open of a period of 06 (Six) months (180-days) from the date of tenders for acceptance.

22.The contractor shall not be entitled to claim or compensation for any loss suffered due to:

a. Natural calamities
b. Act of enemies
c. Transportation and procurement difficulties
d. Circumstances beyond the control of state.

23.The contractor has to maintain a site order book With numbered page and bearing the certificates of the Engineer-in-charge will be kept by the site of work and it will be have to be produced if the Engineer in charge/Inspecting Officer desire for any instruction concerning the work. This shall be property of the department after completion of work.

24.The work beyond the agreement which shall be executed by the contractor, unless specifically ordered by the Superintending Engineer/ Electrical Executive Engineer in writing in SITE ORDER BOOK, and the claim for such work shall be submitted regularly in every month. If the claim is not received in the month to which it is related, it will be treated as barred and to be disallowed.

25. On account of Income Tax, sales tax and other taxes as applicable tax will be deducted from the bill of contractor,

## 26. METHODOLOGY OF TENDER

The tenderer are required to submit their tender in two separate sealed envelops as follows: (Tenders not following this shall be rejected)

### ENVALOP-1

This envelop will super-scribed on the top of the envelop as “TECHNICAL BID” name of the work on top left corner. The envelop should contains the following documents:

(a) N.I.T./Special Condition to tenderer enclosed in this document duly signed and stamped in each page by the tenderer.
(b) Sheet and questionnaire duly filled “Signed and stamped by the Tenderer”.
(c) The cost of the quotation documents in required shape ( as described in sr. No. 02)
(d) Earnest Money required in required shape. ( as described in sr. No.03)
(e) Certified copy of the up-to-date Income Tax clearance certificate,
(f) Certified copy of up-to-date Sales Tax clearance certificate.
(g) Certified copy of letter /certificates of enlistment and renewal as contractors of the different departments (as described in sr. No. 08).
(h) Attested copies of power of attorney/partnership deed, if applicable.

ENVALOP-2

This envelops will super-scribed on the top of the envelop as “Rate Bid” and stand only consists of the following: -

(a) Quotation documents
(b) Page provided for quoting rates duly signed and stamped by the contractor.

This envelop will only be opened after successful opening of the Technical Bid as in Envelop-1

Signature of Tenderer

Superintending Engineer

IGIMS. Patna-14.

# SPECIAL CONDITIONS of contract

01. The contractor(s) shall not stipulate any additional conditions in their tender for increase of rate due increase in rate of taxation railway freight, etc, what so ever.
02. The tenderer must mention in their quotation their Sales Tax Registration Number and amount of Sales Tax paid by them correct and complete in every respect. They should also furnish an up-to-date clearance certificate from the Department of concerned in respect of payment of Tax and Sales Tax.
03. The items detailed in this quotation documents for which tenders are invited are for complete items of works namely cost of materials labour, scaffolding other requisite accessories, equipments etc., for the. finished work in all respect and tenderer must quote his rate as such.
04. Taxes, railway freight and incidental charges in materials and labour in respect of the shall be payable by the contractor and the Government shall not entertain any claim whatsoever in this respect. .
05. Site for execution of work will be available as soon as the work is awarded, in case, if it is not possible for the department to make the entire site available on award of the work, the contractors will have to arrange his working program accordingly. No claim whatsoever

giving site on award of the work and giving the site gradually will be tenable.

06. The contract for the construction /start of the job shall commence from the date of issue pf work-orders.

The work will be executed according to the approved and sanctioned design and drawing, which will be binding on the contractor. No claim to the change or modification in drawings and design will be tenable.

07. The contractor will be issued departmental materials as per availability of the same with department. Materials taken by the contractor in excess of the calculated requirement will be charged to panel rates, which will be double the issue rates of the materials.
08. Quantities mentioned in the bill of quantity are approximate and it may increase or decrease. Nothing extra will be paid for such increase or decrease in quantity of various items or work.
09. No claim shall be entertained on the ground of fluctuation of rates in labour and materials etc. in the market during the period of filling tender and of completion of work.
10. The contractor shall arrange for necessary site accommodation and other facilities such as medical aid for the labour engaged by him at his own cost and no claim on this ground or for any incidental charges shall be entertained.

11. No claim for ideal labour due to non-supply or delay in supply of materials, machinery, design etc by the department will be entertained.
12. The contractor will strictly follow the conditions laid down in the minimum wages Act. He should comply with the labour laws as may be current and furnish information as required from time to time.
13. All materials brought to site by motor vehicle other than vehicles belonging to the contractor this work should be public carriage vehicles. The carriage of such materials by private would be illegal and contractor will accordingly responsible for employing private instead of public carrier.
14. The motor vehicle rules shall be followed by the contractor who will be responsible for infringement of traffic rules, accidents damages to road and etc. No responsibility for all or any the above will rest with the department.
15. The work shall be done according to the CPWD /PWD/ E.W.D /ISI specification. In respect of such items of works which are not covered by the above specifications. The Specifications laid down by the Electricity (Energy) Department, Govt of Bihar, Patna shall be followed, which will be final and conclusive.

16. No claim shall be entertained by the department for cleaning and scrapping rust and other harmful clement from steel.
17. During execution of work, if any item of work which is provided in the B.O.Q. and which is not required to be executed due to change of specification etc, the contractor will have no claim what-so-ever if that item is not got executed through him.
18. The site shall be cleaned of all rubbish, leveled and dressed as directed by the Engineer In Charge and shall be prepared for lay out works. Rushes, weeds, stumps of trees if any shall be removed by the contractor at his own cost before lay-out is taken up. The contractor shall also remove his surplus materials, rubbish etc., and leave the site clean as directed by the Engineer in Charge as directed by the Engineer in Charge. The costs of masonry pegs, strings, labors etc., are incidental expenditure in the layout of the work and shall not constitute claim for the same.
19. The arrangement and cost of all strong-shad, labour, shades, vats, tools and plants scaffolding water supply, electric power supply and building accessories shall be borne by the contractor. He shall also provide all facilities and medical-aid to the labours employed by him at his cost.
20. All conditions attached with N.I.T. and the B.O.Q. will form an integral part of the contract and should be duly signed by the tenderer as token of acceptance while submitting the tender for the work.
21. The contractor will solely be responsible for accident etc., if any; during execution of work and no liability for this shall lie with the department.
22. Before undertaking collection of materials required in the Electrification work shall be incumbent upon the contractors to get the quality approved by the Engineer in charge. Such approved samples of all materials shall be kept in the custody of Engineer in

Charge in sealed jars or boxes for comparison later on with the collection made during progress of work.

23. The Engineer in charge will have full power to remove from the premises of the site, all materials which, in his opinion , are not in accordance with specifications and in case of default, the Engineer in charge will be at liberty to sale such inferior materials at the contractor risks or remove from the site at the contractors risk and cost.
24. The contractor shall offer all facilities to the department officers for supervisions, checking of bills etc., and any damages in the progress will be made good by the contractor on his own cost.

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25. PAYMENT SHALL BE MADE FOR ACTUAL QUANTITY OF EVERY ITEMS OF WORK DONE ON ACTUAL MEASUREMENT.
26. It shall be incumbent upon the contractor to adjust the strength of the labour and organizational machinery for execution of works according to the and no claim what-so-ever shall be entertained by the department for ideal labour and management for reasons of inability of the department and supply department materials in time.
27. After the work /job are completed by him, the contractor shall:
    a. Remove from the site all his surplus materials and rubbish and also dismantle and remove all his temporary device made in the process of execution of the work and fill up any pits where necessary and leave the site in a nice and tidy manner.
    b. Make over the building and ground to the Engineer in charge in clean and fit state for occupation and use. The work and contract shall not be considered complete until all these things are done.
28. The layout plan of the structure/ building /.equipments on which work to be carried out will be the responsibility of the contractor but the work shall not be taken-up in hand before the Engineer in charge or his representative has satisfied him-self of the correctness of the layout.
29. The contractor is to provide all times during the progress of the work and the maintenance period means of access with ladders, gang-way etc. and the necessary attendance to move in and adopt as directed for the work by the engineer in charge or his staff.
30. The contractor is to make his own arrangements for the purpose of lighting of the whole site. If however the contractor is allowed to take the electric supply from the town distribution system by the

Competent authority in-charge of the Electric Supply Department, he has to provide his own cost the temporary connection and lines etc. which shall be removed after the completion of the contract period. The cost of electricity charges and taxes will be borne by the contractor.

31. All quarry fees, royalty, duties, taxes ground rent etc., if any shall be born by the contractor.

32. The contractors on starting the work shall furnish to the Engineer In charge a program for carrying out the work stage by stage in stipulated time. Graphs or chart on each individual work shall be maintained by the contractor at site showing the progress, week by week.
33. The contractor shall placed and keep on the works at all time efficient and competent staff to give necessary direction to his workers and to ensure that they execute their work in sound and proper manner and shall employ only such supervision workmen and labour in or about the execution of work as are careful and skilled in performing proper execution of work as per the standard norms
34. The contractor shall at once remove from the works any agent permitted for sub-contractor, supervisor, workmen or labours whom is objected to, by the engineer in charge. He shall submit a correct return showing the names of all staff and workmen employed by him. In the event of the engineer in charge having the opinion that the contractors is not employing on the sufficient number of staff and workmen as is necessary for the proper completion of the work within time prescribed, the contractor shall forthwith on receiving intimation to this effect, take on the additional number of labour /staff within seven days of being so intimated and failure on the part of the contractor to comply with such instruction will entitle the E/I to reject the tender and take action during the course of the execution of work.

35. The special conditions of instruction supplement the instruction to the tenders and the general conditions of contractor for the work shall be considered as part of the contract papers. Where the provision of the general condition is at variance with these special conditions of the contract the provision of this special condition prevails.

36. As far as practicable, after he had been instructed to begin the work, the contractor shall be required to submit the procedure and manner in which he proposes to carry out the contract works which the contractor intends. The submission for approval by the Engineer in charge of such program or the finishing of each particular shall not relieve the contractor of any of his duties or his responsibilities under this contract.

37. The contractor shall be responsible for the time and proper settlement of the works and for the corrections in the work and provision and supply all necessary instruments, appliances, materials and labours in connection therewith at his own cost. If at any time during the progress of work, any error shall appear or arise in the structure, the contractor on being required so to do by engineer in

charge, representative for correction thereof, the contractor shall carefully protect all bench, marks, and other things used in setting out the work.

38.The Electrification work executed by the contractor shall be maintained by him, for a period of 06 (six) months after satisfactory completion of work, during which the contractor shall be responsible for any defect that may develop in the materials or in the workmanship and shall make them good to the satisfaction of the engineer in charge. Where the items of work are not explicitly clear from drawing or the estimate, the decision of the engineer in charge on anything not included in the specifications will be final

39. The contractor has to sign the agreement in the prescribed form and all works shall be subject to the terms and conditions in it. Where there is not mentioned of any detailed specification for items of work, Energy ( Electricity ) department Specification will be followed.

40.The approved contractor shall have to engage a qualified engineer to execute and supervise the progress and completion, testing and commissioning of the work, the work and take instructions from the officer of the Department.

41.In case of any dispute regarding specification, the method of measurement other requisites method of execution the unilateral decision of the Electrical executive Engineer, I.G.I.M.S., Patna-14 will be final and binding on the contractor without any scope of reference to higher authorities or court of law.

42. Payment will be made only after satisfactory completion, testing and commissioning as well as result of the quality control to be examined and approved by the Engineer of IGIMS, Patna.

43. subletting of the work is not permissible.

Superintending Engineer

IGIMS. Patna-14.

## ANNEXTURE I

## Details of FEEDER PANELS

### 1.1 SCOPE

This scope shall cover design, manufacture, supply, installation, testing Feeder Panel as described in Bills of quantities (A) and Drawings (B) & (C)
Feeder Panel Board will be installed outdoor and is connected through the cables.
Panels shall be suitable for operation on 3 Phase 415 volts, 50 cycles, 4 wire systems, neutral Grounded at transformer.
Distribution panels shall comply with the latest Relevant Indian Standards and Electricity Rules and Regulations and shall be as per IS-13947-1993.

### 1.2 SERVICE CONDITIONS AT SITE

Ambient Temperature: Max. / Min. = 55° C. / 3° C.
Design temperature: 60 Degree C.
Relative humidity: 100%
Voltage: 415+/- 10%, TPN
Frequency: 50 Hz. + 3% to -6%
Neutral: Solidly / earthed neutral.
Fault level: 18.4KA, Symmetrical at 415V solidly earthed.

### 1.3 GENERAL SPECIFICATIONS:

All the Panels shall be metal clad, totally enclosed, rigid, floor mounting, air insulated, and cubicle type suitable for operation on three phase / 415 V / , 50 Hz., neutral effectively grounded at transformer and short circuit level as mentioned in the drawings (B) & (C)

Degree of protection for following type of distribution panel enclosure shall be as per IS:13947-1993. . IP 65 for outdoor panels.
The painting of all the metal part shall be with seven tank process followed by powder coating as per the standard.
The Panels shall be designed to withstand the heaviest condition at site, with maximum expected ambient temperature of 50° c., 95% humidity.

### 1.4 STANDARDS AND CODES:

The Panels shall comply with the latest edition of relevant Indian Standards and Indian Electricity Rules and
Regulations. The following Indian standards shall be complied with :

**STANDARD NO. PARTICULAR**
**IS : 4237** General requirements for switchgear and control gear for voltages not exceeding 1000 V a.c. or 1200 V d.c..
**IS : 5578** Guide for marking of insulated conductors.
**IS : 11353** Guide for uniform system of marking and identification of conductors and apparatus Terminals.
**IS : 13947** Low voltage switchgear and control gear.
**IS : 8197** Terminal marking for electrical measuring instrument and their accessories.
**IS : 2551** Danger notice plates
**IS : 10118** Code of Practice for selection, installation and maintenance of switchgear and control gear.
**IS : 8623** Specification for factory built assemblies of switchgear and control gear for voltage upto and including 1000 V A.C. and 1200 V D.C.
Indian Electricity Act and Rules (as amended up to date) and approval of FIA of India.
The Panels also require approval of the consultant at various stage of their manufacture such as design, selection, construction, testing, shipping etc..

1.5 **CONSTRUCTION FEATURES**

Feeder Panels shall be lockable IP65 & 2 mm thick sheet steel cabinet for Outdoor installation, dead front, floor mounting type. The Distribution panels shall be totally enclosed, completely dust and vermin proof and shall be with hinged doors, Neoprene gasket, padlocking arrangement and bolted back. All removable/ hinged doors and covers shall be grounded by flexible standard connectors. Distribution panel shall be suitable for the climatic conditions as specified in Special Conditions. Steel sheets used in the construction of Distribution panels shall be 2 mm thick and shall be folded and braced as necessary to provide a rigid support for all components. Joints of any kind in sheet metal shall be seam welded, all welding, slag shall be rounded off and welding pits wiped smooth with plumber metal. The general construction shall confirm to IS-8623-1977 (Part-1) for factory built assembled switchgear & control gear for voltage up to and including 1100 V AC.

All panels and covers shall be properly fitted and square with the frame, and holes in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with wing nuts. Self threading screws shall not be used in the construction of Distribution panels. A base channels of 70 mm x 40 mm x 5 mm thick / Suitable Size Stand with the 2 mm Sheet Cover the bottom for floor mounted panels. Minimum clearance of 450 shall be provided between the floor of Distribution panels and the lowest unit.

The Internal electrical switchboard shall be made up of high quality polycarbonate thermoplastic, shock proof, anti-corrosive, acid & chemical resistant, fire retardant, self extinguishing, highly impact resistant, halogen free, silicon free, having internally embedded gasket. The panel shall be in accordance with IEC 60 439 – 1 (Fully TTA).

Ingress Protection shall be in accordance with IEC 60 529. Panel Enclosure (Internal) has to be thermoplastic

polycarbonate or of the material which has equivalent or exceeds the inherent features of thermoplastic polycarbonate. Said enclosures, in addition to containing the devices and components that constitute the electrical panel, must have certain properties and characteristics that are specific for their practical use; for e.g. they must provide a suitable degree of electrical insulation, have sufficient structural strength, be easy to handle, ensure adequate resistance to the aggression of chemical and atmospheric agents, be self extinguishing, etc. It should be clean and aesthetically appreciable.

Degree of Protection IP 65, in accordance with IEC 60 529, type tested in accordance with IEC 60 439 – 1.

Internal Insulated enclosures of protection class II shall be made out of environment friendly, recyclable polycarbonate thermoplastic, UV Resistant, halogen & silicon free, highly impact resistant, Anti Acid, Anti corrosive

: Resistant against demands caused by rains, water and corrosive atmosphere, Degree of Protection against

mechanical load IK 08 in acc. with DIN EN 50 102, Color Gray RAL 7032, fire retardant, Glow Wire Tested at 960 deg. cent in acc. with IEC 60 695–2-1, DIN VDE 0304 Part 3. UL Subject 94, V – 2, Flame Retardant, Self

Extinguishing, with transparent / opaque lids having tool operated / sealable / hand operated / lockable quick

fastening mechanism.

Incoming & Outgoing Cable from all the directions….

Mounting Type: Free Standing Type with Canopy of 2 mm thick CRCA Sheet.

Protection Measure: Totally Insulated

Degree of Protection: IP 65 in acc. with IEC 60 529

Rated Voltage: 690 / 1100 V

Bus Bar System: high grade Aluminum bus bars as per description with insulated supports.

Interconnection between solid bus bars and equipment shall be connected by means of bus bar connectors to

avoid tapings on solid bus bars.

Temperature Resistance: - 40 deg. cent to + 120 deg. cent.

Distribution panels shall be of adequate size with a provision of spare switchgear as indicated in the Diagram. Switches shall be arranged in multi-tier. Knockout holes of appropriate size and number shall be provided in the Distribution panels in conformity with the location of cable / conduit connections. Removable sheet steel plates shall be provided at the Bottom to make holes for additional cable entry at site if required.

Every cabinet shall be provided with Trifoliate or engraved metal name plates. All live accessible connections shall be shrouded and shall be finger touch proof and minimum clearance between phase and earth shall be 20 mm and phase to phase shall be 25 mm.

**1.6 BUS BAR CONNECTIONS**

Bus bar and interconnections shall be of high conductivity grade Aluminum as specified in the table of rectangular / Square cross section suitable for carrying the rated full load current and short circuit current and shall be extendable on either side. Bus bars and interconnections shall be insulated with heat shrinkable sleeve of 1.1 KV grade and shall be colour coded. Bus bars shall be supported on glass fiber reinforced thermosetting plastic insulated supports at regular intervals to withstand the force arising from in case of short circuit in the system. All bus bars shall be provided in a separate chamber and all connections shall be done by connected by means of bus bar connectors to avoid tapings on solid bus bars. Additional cross sectional area to be added to the bus bar to compensate for the holes if required. All connections between bus bars and breakers shall be through solid / aluminum strips of proper size to carry full rated current and insulated with insulating sleeves. The busbar shall be air insulated and made of high quality, high conductivity, high strength Aluminum.

The busbar shall be of 3 phases and neutral system with separate neutral and earth bar. The size of neutral busbar in all panels or lighting panels and feeders shall be equal to phase busbar. The busbar and interconnection between busbars and various components shall be of high conductivity Aluminum. The busbar shall be of rectangular cross-section designed to withstand full load current for phase and neutral busbars. The busbar size shall be as per required current rating. The busbar shall have uniform cross-section throughout the length.

The busbars and interconnections shall be insulated with epoxy coated bus sleeves. The busbar shall be supported on glass fiber reinforced thermosetting plastic insulated supports type at sufficiently close intervals to prevent busbars sag and shall effectively withstand electromagnetic stresses in the event of short circuit capacity of 18.4 KA RMS symmetrical for 1 sec.

The busbar shall be housed in a separate compartment. The busbar shall be isolated to avoid any accidental

contact. The busbar shall be arranged such that minimum clearances between the busbars are maintained as

below:

Between phases : 30 mm. minimum

Between phases and neutral : 30 mm.

Between phases and earth : 30 mm.

Between neutral and earth : 30 mm. minimum

**Busbar shall be calculated on 55 deg. C. ambient temp. and 85 deg. C. for continuous and short time rating**

**. Busbar surrounding air temperature shall be considered 70 deg. C. for busbar calculation**

All joint shall have non-flammable insulation shrouds for secondary insulation purpose

**1.7 TEMPERATURE - RISE LIMIT**

Unless otherwise specified, in the case of external surface of enclosures of bus bar trunking system which shall be accessible but do not need to be touched during normal operation, an increase in the temperature rise limits of 25° C above ambient temperature shall be permissible for metal surface and of 15° C above ambient temperature for insulating surfaces as per IS 8623(Part-2) 1993.

All main distribution panels and sub distribution panels shall be provided with MCCB of appropriate capacity as per Table mentioned below. All wiring for final distribution boards shall be concealed behind 5 mm thick Bakelite sheet or M S sheet cover. All Distribution boards shall be completely factory wired, ready for connection. All the terminals shall be of proper current rating and sized to suit individual feeder requirements. All the switches and circuits shall be distinctly marked with a small description of the service installed.

Continuous earth bus sized for prospective fault current shall be provided with arrangement for connecting to

station earth at two points. Hinged doors/ frames shall be connected to earth through adequately sized flexible

braids.

**1.8 CABLE COMPARTMENTS**

Cable compartment of adequate size shall be provided in the Distribution panels for easy connection to all incoming and outgoing cables entering from the bottom. Adequate supports shall be provided in cable compartment to support cables.

Minimum 200 mm gap should be provided in the Panel from Metal Enclosure Gland plate to Polycarbonate Cable compartment gland plate.

In Polycarbonate Cable compartment minimum 150 mm gap should be provided from bottom of the cable connector. Minimum 75 mm gap Should be provided between connectors of every cable.

All the cable gland plate should be detachable.

**1.9 MOULDED CASE CIRCUIT BREAKER (MCCB)**

The MCCB should be current limiting type with trip time of less than 10 m sec under short circuit conditions. The MCCB should be either 3 poles as specified in the table below. MCCB shall comply with the requirements of the relevant standards IS13947 – Part 2/IEC 60947-2.

MCCB shall comprise of Quick Make -break switching mechanism, arc extinguishing device and the tripping unit shall be contained in a compact, high strength, heat resistant, flame retardant, insulating moulded case with high withstand capability against thermal and mechanical stresses

**1.10 Interlocking**

Moulded, case circuit breakers shall be provided with the following interlocking devices for interlocking the door of a switch board.

a) Handle interlock to prevent unnecessary manipulations of the breaker.

b)Door interlock to prevent the door being opened when the breaker is in ON position.

c) Defeat-interlocking device to open the door even if the breaker is in ON position.

**1.11 EARTHING**

Earthing shall be provided as per IS:3043-1987.

Aluminum earth bars of 25 mm · 3 mm shall be provided in the Panels for the entire length of the panel. The frame work of the Panels shall be connected to this earth bar. Provisions shall be made for connection from this earth bar to the main earthing bar coming from the earth pit on both side of the Panels.

The earth continuity conductor of each incoming and outgoing feeder shall be connected to this earth bar. The

armour shall be properly connected with earthling clamp, and the clamp shall be made for connection from this earth pit on both side of the Panels.

The earth continuity conductor of each incoming and outgoing feeder shall be connected to this earth bar. The

armour shall be properly connected with earthing clamp, and the clamp shall be ultimately bonded with the earth bar.

**1.12 PAINTING**

All sheet steel work shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphating, passivaiting (seven tank processing) and then painted with electrostatic paint (Powder coating). The shade of

colour of panel inside/outside shall be Gray RAL 7032, confirming to IS Code No.5.

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**1.13 NAME Printing**

A Panel's designation in bold letters shall be printed by black with yellow background at top of the central panel. A separate name will be printed each feeder module door as per requirement.

**1.14 DANGER NOTICE PLATES**

The danger notice plate shall be affixed in a permanent manner on operating side of the Panels.

The danger notice plate shall indicate danger notice both in Hindi and English and with a sign of skull and bones.

The danger notice plate, in general, meet the requirements of local inspecting authorities.

Overall dimensions of the danger notice plate shall be 200 mm. wide x 150 mm. high.

The danger notice plate shall be made from minimum 1.6 mm. thick mild steel sheet and after due pre-treatment to the plate, the same shall be painted white with vitreous enamel paint on both front and rear surface of the plate.
The letters, the figures, the conventional skull and bones etc. shall be positioned on plate as per recommendation of IS : 2551-1982.
The said letters, the figures and the sign of skull and bones shall be painted in signal red colour as per IS : 5-1978.
The danger plate shall have rounded corners. Location of fixing holes for the plate shall be decided to suit design of the Panels.

**1.15 METERS & INDICATING LAMPS**

i.) One Analog voltmeter of flush type mounting size 96X96 mm of 440 volt along with a 3 phase selector switch has to be fitted on the panel as shown in the diagram to indicate the incoming voltage in the incomer MCCB.
ii.) Three LED type Indicating lamps backed by 2 Amps MCB with non fading colour lenses of Red, Yellow and Green colour connected to the three outgoing phases of incomer MCCB is to be installed at the panel as shown in the drawing.

**1.16 FOUNDATION OF FEEDER PANEL**

The foundation of the Feeder panel will be constructed as per drawing of the foundation.
There will be sand layer of 75mm then brick soling than a layer of 75 mm PCC . Above this there is Brick work of 600 mm and finally 75 mm PCC work at which the base frame of Feeder panel will be grouted.
It will have PVC pipes of suitable size for incomer and outgoing cables in the Feeder panel.

**(A)**

| Bill of material for each Feeder Panel | | |
|---|---|---|
| Sr no | Item | Unit |
| 1 | Feeder panel complete along with angle base and civil foundation as described in the Annexure I | 1 set |
| 2 | MCCB , 3 pole 415 volt , thermal release range 250- 320 Amp Ic= 35 KA with direct rotary handle, ( L & T DH 400 / Schneider NSX 250) | 1 set |
| 3 | MCCB , 3 pole 415 volt DH, thermal release range 80-100 Amp Ic- 25 KA with direct rotary handle (( L & T DH 400 / Schneider NSX 100) | 6 sets |
| 4 | Danger Notice Board as mentioned in work scope 1.16 | 1 set |
| 5 | Flush mounting type 440 volt Analog voltmeter 96x96 mm as described in Annexure I 1.15 | 1 set |
| 6 | Rotary switch for the selection of 3 phase voltage for the Voltmeter as described in Annexure I 1.15 i) | 1 set |
| 7 | LED Indicating lamp along with lenses Red , Yellow and Green as described in Annexure I 1.15 ii) | 3 sets |
| 8 | Civil Foundation for the panel as per drawing (C) | 1 set |
| 9 | Earthling pit as as described in Annexure I 1.11 | 2 sets |

Foundation of Feeder Pillar

Plan

P.C.C

600mm

300mm

75mm

P.C.C

250mm

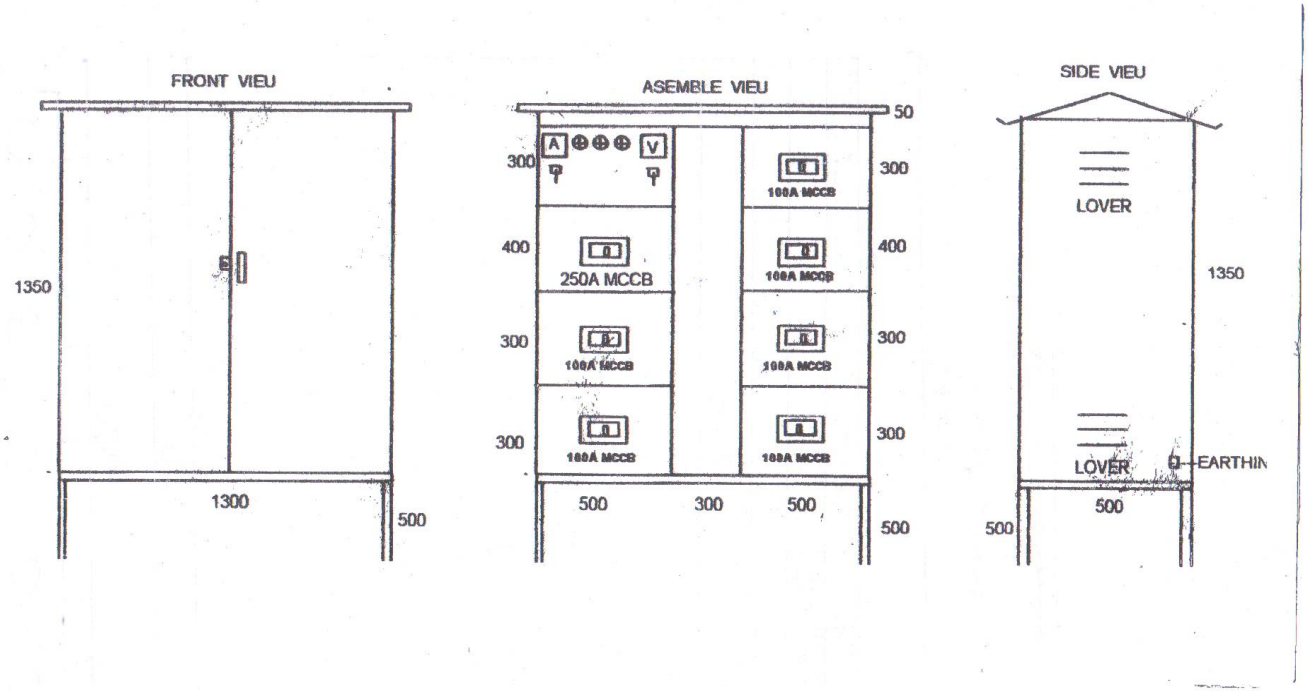
75mm

1400mm

Front view

700mm

Side view


FRONT VIEU
1350
1300
500
ASEMBLE VIEU
50
300
400
300
300
300
400
300
300
500
300
500
250A MCCB
100A MCCB
SIDE VIEU
LOVER
1350
LOVER
EARTHIN
500
500