

KERALA INDUSTRIAL INFRASTRUCTURE DEVELOPMENT CORPORATION(KINFRA)
(A statutory body of Govt of Kerala)

KINFRA HOUSE, TC 31/2312, Sasthamangalam, Thiruvananthapuram -695 010
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Notice Inviting Tender (NIT)

(KINFRA - 6)

- Tender No** : KINFRA/PCP/ 01/ 2024-25
- Name of Work** : Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal.
- PAC** : Rs. 3,87,384/-
- EMD** : Rs. 9,685/-
- Period of Completion** : 3 weeks
- Bid Submission Fee** : Rs. 914/-(Inclusive of GST)



KERALA INDUSTRIAL INFRASTRUCTURE DEVELOPMENT CORPORATION

(A Statutory Body of Govt. of Kerala)

KINFRA HOUSE, TC NO.31/2312, SASTHAMANGALAM P.O,
THIRUVANANTHAPURAM

Tender No : **KINFRA/PCP/ 01 /2024-25**

Name of Work : **Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal**

Locality : **KINFRA Petrochemical Park, Ambalamugal**

Last date of Submission : 26/10/2024, 3.00PM

Name of Bidder :

Address of Bidder :
.....
.....

Registration and Class :

Validity period of :

Registration

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TENDER NOTICE

 KINFRA INSPIRING GROWTH	KERALA INDUSTRIAL INFRASTRUCTURE DEVELOPMENT CORPORATION (KINFRA) Thiruvananthapuram, Kerala		
<u>Tender</u>			
Managing Director, KINFRA invites item rate tenders in single cover bid system for the following work in the prescribed form, from competent and eligible contractors/firms, who fulfil the eligibility criteria prescribed:			
Name of Work: Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal			
PAC	Bid fee	EMD	Last Date of submission
Rs 3,87,384.00	Rs. 914/- (Inclusive of GST)	Rs. 9,685/-	26/10/2024, 3.00PM
Tender document (Non- transferable) can be purchased from the office of KINFRA Hi-Tech Park, Near Medical College, HMT Colony P.O., Kalamassery, Eranakulam- 683503, Phone – 0484 2559790 , on any working days from 19/10/2024 to 26/10/2024 (<i>between 9:30 am and 3:00 pm</i>) on a Tender Fees of Rs. 914/- (inclusive of 18% GST).			
Place: Kalamassery Date: 19/10/2024		Sd/- Managing Director	

GENERAL GUIDELINES

- 1. The book of “General Conditions of Contract” is applicable to both types of tenders i.e.” Percentage rate tenders and Item rate tenders”. Accordingly, alternative provisions for conditions Nos. 4, 10 & 12 of the General Rules and Directions are given in this book. The appropriate alternatives will be applicable in specific cases depending on whether this is used for percentage rate tender (KINFRA-7) or item rate tender (KINFRA-8). “General Conditions of Contract” shall be available in downloadable manner from website “www.kinfra.org”**
- 2. KINFRA-6 abridged from KINFRA-7/8, Schedules A to F, special conditions/specifications and drawings will be issued to intending tenderers only. The standard form will not be issued along with the Tender Documents but the same shall form part of the agreement to be drawn and signed by both parties after acceptance of tender.**
- 3. The intending bidders will quote their rates in Schedule A ie. Schedule of Quantities.**
- 4. The proforma for registers and Schedules A to F are only for information and guidance. These are not to be filled in the Standard Form. The Schedules with all blanks, duly filled, shall be separately issued to all intending tenderers. For filling and returning in the manner prescribed.**

Notice Inviting Tender (KINFRA 6)

Managing Director, KINFRA invites **item rate** tenders in **Single cover** bid system for the following work in the prescribed form, from competent and eligible contractors/firms, who fulfill the eligibility criteria prescribed

NI T No	Name of work & Location	Estimate d cost put to bid	EMD	Period of completion	Last date of submissi on of Tender document , EMD, Tender fee & Other document s as specified in Tender Notice	Time & Date of openi ng of Tech nical bid	Tender Cost	Class of registrat ion
1	2	3	4	5	6	7	8	9
KINFRA PCP/ 01/2024- 25	Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal	Rs. 3,87,384/ -	Rs 9685.00	3 weeks	26/10/2024, 3.00PM	26/10/2024, 3.30PM	Rs. 914/- (Inclusive of GST)	Valid B class Electrical Licence

1. Eligibility Criteria:

Contractors who fulfil the following requirements shall be eligible to apply.

- a. Should have a valid B class Electrical Licence from Electrical Inspectorate.
 - b. Bidder should have GST registration.
2. The time allowed for carrying out the work will be 3 weeks from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
 3. The site for the work is available.

4. The bid document consisting of specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form. General Conditions of Contract (KINFRA- 7/8) is also attached separately along with this document.
5. **Tender Purchase:** **Tender document (Non- transferable) can be purchased** from the office of **KINFRA Hi-Tech Park, Near Medical College, HMT Colony P.O., Kalamassery, Ernakulam- 683503, Phone – 0484 2559790**,, on any working days from **19/10/2024 to 26/10/2024 (between 9:30 am and 3:00 pm)** on a payment of **Rs.914.00/- (inclusive of 18% GST)**.Bidder has to submit request for issue of document in their letter head.

Tender Submission: Tender shall be submitted in sealed envelope, duly super scribed “**Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal**”. This sealed cover shall be addressed to **The Managing Director, KINFRA Petrochemical park, Ernakulam- 683503, Phone – 0484 2559790**,

6. The tender in the prescribed format along with EMD and other required details, in sealed cover should reach **KINFRA Hi-Tech Park, Near Medical College, HMT Colony P.O., Kalamassery, Ernakulam- 683503, Phone – 0484 2559790**,on or before **26/10/2024, 3.00PM**.
7. The bid submitted will be opened on **26/10/2024, 3.30PM in the office of KINFRA Hi-Tech Park, Near Medical College, HMT Colony P.O., Kalamassery, Ernakulam- 683503, Phone – 0484 2559790**,
8. Tender processing fee of **Rs. 914/- (inclusive of 18% GST)** to be remitted as DD in favour of Managing Director, KINFRA payable at Trivandrum.
9. **Earnest Money Deposit (EMD):** The bidder has to submit an amount of **Rs.9685/-** as DD from a Scheduled/National bank in the form of DD in favour of Managing Director, KINFRA payable at Trivandrum. EMD of the unsuccessful tenders will be refunded without any interest on finalisation of the contract with the successful bidder. EMD will be refunded to the Contractor after remittance of performance guarantee and execution of the agreement.
10. **Performance Guarantee**, the amount collected at the time of executing contract agreement, will be 5% of the contract value (agreed PAC) and the deposit will be retained till the expiry of Defect Liability Period. At least 50% of this deposit shall be collected in the form of Treasury Fixed Deposit and the rest in the form of Bank Guarantee. The

validity of BG shall be upto 3 months after defects liability period mentioned in Schedule F. However applicable Government orders amended time to time shall prevail.

Additional Performance Guarantee will be required in all cases where quoted rate falls below 10% of the estimate cost. The 10% standard exemption will be applicable to all estimates quoted below estimate cost. If the rate quoted by the contractor is x% below estimate cost (x lies above 10% upto quoted rate) the additional performance guarantee for an amount equal to (x-10) % of the estimate amount shall be obtained from the contractor. 50% of Additional Performance Guarantee shall be in the form of Treasury Fixed Deposit and rest in the form of Guarantee issued from any Nationalised Bank/Scheduled Bank/ Kerala Financial Corporation or any other forms prescribed in the Kerala PWD Manual. This shall be collected before executing the agreement in the same form as Performance Guarantee and may be released while passing the final contract bill. This is subjected to change as per government orders issued from time to time in this respect. However applicable Government orders amended time to time shall prevail.

As per G.O.(P) No.168/2019/Fin dated 07/12/2019, for item rate contracts, if the rate quoted by the bidder for an item of work is “X%” below estimate cost where “X” lies above 10%, the Additional Performance Guarantee for that item of work is equal to (X-10)% of the estimate amount of that item of work. The total Additional performance guarantee for the whole work is the total of individual Additional Performance Guarantee for each item of work calculated as above.

Performance Security Deposit: It is the retention amount deducted from the running bill of the contractors in addition to the Performance Guarantee. This will be @2.5% of the gross amount of each running bill so that the amount so retained shall be 2.5% of the value of the work done till then. This can be released against Bank Guarantee on its accumulation to a minimum amount of Rs. 5 lakhs subject to the condition that the amount of Bank Guarantee except last one shall not be less than 5 Lakhs. This amount will be released after passing of final bills as in the case of refund of deposit.

11. The bid submitted shall become invalid if:
 - a) The bidder is found ineligible.
 - b) The bidder does not submit all the documents (as stipulated in the bid document).

12. **The description of the work is as follows:** Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The

bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by KINFRA and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of Managing Director, KINFRA, Trivandrum does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
15. The competent authority on behalf of Managing Director, KINFRA, Trivandrum reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to bid for works if he/she is the near relative of an officer of KINFRA posted as Project Officer or Finance Officer.
17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of Kerala is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of Kerala in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of Kerala as aforesaid before submission of the bid or engagement in the contractor's service.
18. ***The bid for the works shall remain open for acceptance for a period of 120 days from the date of opening of bids.*** If any bidder withdraws his bid before the said period or issue of work order, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to KINFRA, then KINFRA shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the rebidding process of the work.

19. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of: -
- a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as submitted at the time of invitation of bid and the rates quoted at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - b) Standard KINFRA Form 7/8 or other standard KINFRA Form as applicable
20. The orders or circulars issued on technical and financial matters by the Government shall stand automatically incorporated in the tender document issued subsequent to such circulars/orders.

List of Documents to be submitted in sealed Envelope:

- I. Tender Document duly filled and signed (Each page should be signed by the bidder with seal).
- II. EMD
- III. Registration Certificate of the Contractor.
- IV. Certificate of Registration for GST
- V. BOQ (Price Part)

KERALA INDUSTRIAL INFRASTRUCTURE DEVELOPMENT CORPORATION

Item Rate Tender & Contract for Works

(A) Tender for the work of:-

Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal.

(i) To be submitted/ uploaded by.....hours on.....
to...../ upload at www.etenders.kerala.gov.in

e-TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for KINFRA within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for 120 days from the due date of its opening of technical bid.

A sum of Rs. has been deposited in prescribed manner as Earnest Money Deposit (EMD). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that KINFRA shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/We agree that KINFRA shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of KINFRA, then I/We shall be debarred for tendering in KINFRA in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Date:

Witness:

Address:

Signature of Contractor

Postal Address:

Occupation:

Certificate of near relatives

DECLARATION

(To be submitted by the Contractor regarding near relatives working in KINFRA as per clause 16 of KINFRA-6)

"I s/o Shri.....
Resident of.....
.hereby certify that none of my relative(s) as defined in clause 16 of KINFRA-6 is/are employed in concerned Department of KINFRA.

In case at any stage, it is found that the information gives by me is false/incorrect, KINFRA shall have the absolute right to take any action as deemed fit without any prior information to me."

Signature of Contractor

DECLARATION

I / we hereby declare that I/we have not been Black listed, debarred/suspended by any Central/State Govt. Depts/Central/State Govt. PSUs, Autonomous and statutory bodies under State/Central.

Signature of Contractor

Proforma of Schedules

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

SCHEDULE 'A'

Schedule of quantities (as per BOQ)

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

Nil

SCHEDULE 'C'

Tools and plants to be hired to the contractor.

Nil

SCHEDULE 'D'

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

Nil

SCHEDULE 'E'

Reference to General Conditions of contract: uploaded in www.kinfra.org

Name of work **Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal.**

Estimated cost of work: **Rs.3,87,384/-**

(i) Earnest money: **Rs. 9685/-** (to be returned after receiving performance guarantee)

(ii) Performance Guarantee:**5% of tendered value.**

(iii) Security Deposit:**2.5% of each bill**

SCHEDULE 'F'

GENERAL RULES & DIRECTIONS: NIT shall be read with General conditions of contract for KINFRA (available in website www.kinfra.org)

Officer inviting tender: Managing Director, KINFRA

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with clauses 12.2 & 12.3 :As per clause 12

Definitions:

2(v)	Engineer-in-charge	:means the Engineer officer of KINFRA who shall supervise and in-charge of work.
2(viii)	Accepting Authority	:Managing Director, KINFRA
2(x)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(xi)	Standard Schedule of rates	:CPWD DSR 2018 & Market Rates
2(xii)	Department	:KINFRA

Clause 1

i)	Time allowed for submission of Performance Guarantee from the date of issue of work order	3 weeks
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Clause 2

Authority for fixing compensation under clause 2. :Managing Director, KINFRA

Clause 2A

Whether Clause 2A shall be applicable :No

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start :10 days

Milestone : NA

Time allowed for execution of work:**3 weeks**

Authority to decide:

- a. Extension of time -**Managing Director, KINFRA**
- b. Rescheduling of milestone-**Managing Director, KINFRA**
- c. Shifting of date of start in case of delay in handing over of site-**Managing Director, KINFRA**

Clause 6, 6A

Clause applicable - (6 or 6A) Clause 6

Clause 7

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment Minimum 3 lakhs or monthly once

Clause 11

Specifications to be followed for execution of work 1) CPWD Specifications 2019 Vol1 & 2 for Civil and relevant CPWD Specification for Electrical with latest amendments.

Clause 12

Type of work- Original work.

12.2 & 12.3	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building work	As per clause 12 of General Conditions
12.5	(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earth work subhead in DSR and related items)	As per clause 12 of General Conditions

(ii) Deviation Limit for items mentioned in earth work subhead of DSR and related items As per clause 12 of General Conditions

Clause 16

Competent Authority for deciding reduced rates. Managing Director, KINFRA

Clause 17

Defect liability Period : 3 year

Clause 31

Contractor shall make his/their own arrangement for water and power required for the work and nothing extra will be paid for the same. Water if available may be supplied to the contractor by KINFRA, the water charges @1% shall be recovered on gross amount of the work done.

Clause 36(i)

The contractor shall provide and employ technical staffs for site supervision, quality assurance and ensuring safety. Assistant Engineers retired from Govt. services who holds Diploma will be treated at par with Graduate Engineers. Diploma holder with minimum 10yr relevant experience with a reputed construction company can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of Degree Engineers.

I.All works shall be carried out at site as per CPWD Specification for Civil-2009 Vol1&2, with latest amendments and CPWD General Specifications for electrical-2013, with latest amendments.

Technical Specification of L.V. Switch Boards

Conformity to Standards

The switchboards and motor control centers (commonly referred to as “board” hereinafter) shall conform to the relevant provisions of the IE rules and all panels supplied for the project shall be type tested and certificates shall be produced during supply.

Approvals and Certification

The boards shall have the following:

- a) BIS certification
- b) Tariff Advisory Committee approval
- c) CPRI type test certificate

Approval by Kerala State Electrical Inspectorate

The boards shall be manufactured to comply with the requirements of the Kerala State electrical inspectorate. This implies that the manufacturer shall be aware of the latest standards and practice stipulated by the Electrical Inspectorate of Kerala State with respect to switchboards. The Contractor shall obtain approval from the Electrical Inspectorate for all the equipment supplied. The panels should be fabricated by a CPRI certified factory.

Drawings

The Contractor shall prepare and furnish to the Consultant/Client detailed drawings of the boards and its parts with all the required information within fifteen days of award of contract. The manufacture shall be taken up only after receipt of the approved drawings from the Electrical Inspector. The Contractor shall take action in this matter in such a manner that the process of submission of drawings and details and their approval by Consultant / Client are completed in time to adhere to the stipulated delivery period.

The drawings and details to be furnished for Consultant’s approval shall include the following:

- a) Front view, end views, plan and sectional views of the Board to clearly show all details relating to arrangement of various components, interconnections, clearances, etc.
- b) Schematic wiring diagrams of the main and auxiliary circuits.
- c) Bills of materials giving details of designation, make, type, rating, etc of the various component parts mounted on the board.

Details which are not clear in the drawings shall be subject to necessary modification during inspection.

Tests

All standard routine tests as specified in relevant Indian Standards shall be carried out by the manufacturer on the board and its parts. These tests are to be carried out in

the presence of the representative of the Consultant/Client and detailed test reports are to be furnished.

Following tests shall be carried out:

- a) Verification of the board as per the approved drawings.
- b) Visual inspection of board for compliance with specifications, workmanship, etc.
- c) Operational tests on all the switchgear.
- d) Operational and accuracy tests on the protective gear such as relays, annunciation system, indicating lamps, etc. by injecting the required voltage/current into the circuits.
- e) Operational and accuracy tests on the meters by injecting suitable voltage/current into the circuits.
- f) Insulation resistance measurements of power circuits
- g) Insulation resistance measurements of control circuits
- h) High voltage test using 2.5 kV for one minute between each pole and earth.
- i) Insulation resistance measurements under items c and d are to be carried out after high voltage test also. Results of all the tests shall be recorded and furnished to the Consultant/Client. Test certificates of breakers, relays etc. used in the board shall be furnished.

Inspection

The Contractor shall intimate the Consultant/Client sufficiently in advance of the readiness of the board for inspection and testing. The Contractor shall provide all required facilities to carry out the inspection and witnessing of tests.

Data Relating to Boards

The boards shall be supplied to comply with the data as furnished under “Data Sheet for Switchboards” forming part of these documents.

Service Conditions

The conditions at the location of installation, power system characteristic and other details are furnished under Data Sheet for Switchboards and Capacitor Banks” forming part of these documents. Equipment supplied shall be suitable for continuous operation under the conditions specified. If any further detail relating to service conditions is required, the Contractor shall specifically request for such detail.

Location of Installation

The contractor shall inspect and study the proposed location of each board and ensure that the board is manufactured giving due consideration to site conditions, clearances required, transport route, etc. Clearances as per the relevant standards and as approved by the Inspectorate shall be maintained while finalizing the location of various switchboards.

Irrespective of the locations shown in the drawings, the switchboards shall be installed only after confirming the locations in consultation with the Consultant/Client. The switchboards shall be easily accessible to authorized persons.

General Construction

The board shall be of sheet-steel, totally enclosed, vermin-proof, flush dead front, modular and fully compartmentalized construction. The different breakers and

switches shall be housed in separate and independent totally metal enclosed compartments. Each compartment shall have door with padlocking facility. The board shall be easily extensible at both ends.

The board shall be complete with an integral base framework of adequate design and construction so that the board can be directly mounted using suitable foundation/anchoring bolts. It shall be suitable for functioning efficiently and continuously under the service conditions specified.

Enclosure

The enclosure of the boards shall be made of cold rolled sheet steel. The enclosure shall be floor or wall-mounting type construction as specified. When floor-mounted, it shall be of free standing and self-supporting type construction. When wall-mounted, it shall be surface-mounting type or recessed type as specified.

The enclosure shall be so designed and constructed as to prevent the entry of dust, water, insects and vermin. All door, detachable covers, plates, etc. shall be provided with effective gaskets. The covers shall be provided with fasteners which would ensure tight closing of the covers by proper gaskets. Ventilating louvers, if provided, shall be provided with brass wire mesh screens to prevent entry of vermin.

The enclosures may be constructed so as to have access to the board both from front and rear or single front type where there will be access only from the front of the board and the back will be completely closed. The type of access shall be as specified. Every compartment in the board shall be totally segregated from other compartments by sheet steel enclosure on all sides with insulating bushes for entry and exit of power and control wiring and interconnections. No live component shall be mounted on the door of the compartment.

Suitable inscriptions shall be provided / bakelite designation labels shall be fixed on the compartment doors. Bus bar chambers shall be provided with screwed covers, cable alleys, meter and relay compartments and switchgear compartments shall be provided with hinged doors which shall be closed tight by means of screws with moulded plastic knobs. All the hinges shall be of concealed type.

The covers and doors shall be properly stiffened by means of ribs or other stiffeners against wobbling. Wherever hinged doors are provided and live parts are accessible by opening the hinged doors, adequate shrouding shall be provided using FRP barriers to prevent unintentional contact with the live parts.

The minimum thickness of cold-rolled sheet steel used for the fabrication of the board shall be 2 mm. The folded sections forming the base and vertical framework shall be fabricated out of cold-rolled sheet steel having a minimum thickness of 3mm. Comparatively large covers and doors shall be fabricated using 3mm thick sheet steel.

The structure of the enclosure shall be strong and rigid and shall not suffer any distortion during transport, handling or erection. Different parts of the enclosure shall be able to withstand without any shake or vibration, the static and dynamic loading of various components installed in the enclosure. The board shall be stable under all the required conditions for loading and operation. Adequate lifting hooks shall be provided.

Bolt holes shall be provided in the bottom framework for the foundation bolts. In the case of wall-mounting boards, holes shall be provided for the bolts either on the back

plate of the board or on external lugs. Required foundation/anchor bolts, nuts and washers shall be supplied along with the boards.

The height of enclosure shall be the same throughout the board. The metalwork of the enclosure shall be fabricated to good quality finish with the surface level and smooth without any flaw. The corners shall be rounded. The metalwork of the enclosure shall be fabricated in a shop with adequate facilities such as power- operated guillotine shears, press brakes, presses, powder-coating plant, etc.

The metalwork shall be powder coated after treatment. All fabricated steel parts of the enclosure and framework shall be subjected to the following treatment before powder coating:

- a) Degreasing using hot alkaline solution
- b) Rinsing with cold water to remove all traces of alkaline solution.
- c) Pickling using dilute sulphuric acid and pickling inhibitors to remove oxide, scale and rust formation.
- d) Rinsing with cold water to remove all traces of acidic solution
- e) Phosphate using zinc phosphate solution
- f) Rinsing with cold water to remove all traces of phosphate solution.
- g) Passivating by rinsing in de-oxalate solution to neutralise traces of salts.
- h) Drying with compressed air.

Bus Bars

Bus bars shall be arranged in horizontal and vertical formations as required. Bus bars shall be air insulated.

More than one conductor shall not be from one connection point on the bus bar. At every point of connection, two bolts shall be used to prevent the conductor from rotating around one bolt. If two bolts cannot be used, alternative arrangement shall be provided to prevent rotation of the conductor around one bolt.

Bus bars shall be so arranged and access provided from outside so that it will be possible to inspect and work easily on all the points of support and connections. The bus bars and bus bar chambers shall be extensible on both sides of the board so that the boards can be extended on both sides. For bus bars exceeding 2000mm length, allowance for expansion shall be provided by means of well-designed and installed flexible expansion joints.

All bus bars shall be of high conductivity electrical grade copper / aluminum extrusions of reputed manufacture. The main horizontal bus bars shall be of the same section throughout the length of the board. Their current rating shall be equal to the full rated current of the incoming breaker / switch. The current rating of the neutral bar shall be 50% of that of the phase bus bar. The branch bus bars shall have current rating equal to the total of the full rated currents of all the outgoing breakers and switches connected to them provided that: -

- a) The current rating need not be higher than the main bus bars, and that
- b) The bus bars will have short circuit rating equal to that of the main bus bars.

The size of the main and branch bus bars shall be got approved by the Electrical Inspector. The maximum current density allowable for aluminium bus bars is 0.8 Amps/Sq.mm and 1.2Amps/Sq.mm for copper. Any de-rating required by the Electrical Inspectorate shall be taken into consideration while fixing the sizes of the bus bars.

The boards shall be provided triple pole and neutral bus bars as specified. The cross-sectional area of the bus bars and the supports provided for the bus bars shall be capable of withstanding without damage the electromagnetic and thermal effects of short-circuit current. Moulded SMC/DMC/FRP supports shall be used for supporting the bus bars.

Bus bar joints shall be of bolted type. Only cadmium or zinc passivated high-tensile steel bolts, nuts and spring washers shall be used. Lock washers shall be used in all bolted connections.

Bus bars shall be given colour coding. The bus bars shall be provided with heat shrinking PVC Sleeves throughout their length. Where it is not possible to provide PVC sleeving, moulded FRP shrouding shall be provided. No hylam is permitted. Where the bus bar of one phase or neutral consists of more than one conductor, the space provided between the parallel conductors shall be equal to the thickness of the single conductor. Spacers of the same thickness shall be provided between the parallel conductors at intervals not exceeding 600mm and bolted together with the bus bars.

Cable Alleys

The cable alley shall be spacious enough to accommodate all the cables to be installed inside it and also to facilitate their proper routing, clamping, shaping and termination without causing any strain to the cables and terminations.

Cable alleys shall be provided with hinged doors. The cables alleys shall have detachable glanding plates at the top and bottom. The glanding plates shall have adequate space to comfortably accommodate all the cable glands that would be installed on it. The glands shall be so spaced that it will be possible to work on the different cable terminations without any difficulty.

The terminals in the cable alley shall be shrouded so that it should be safely possible to work on any set of terminals after switching off the concerned feeder while the other terminals in the cable alley remain live. FRP sheets or moulded components shall be used for the shrouding. No hylam shall be used. The terminals in the cable alley shall be suitable to accept the maximum size of cable that may be used for the feeder. The terminals shall be adequately and conspicuously labelled for identification with its corresponding switch/control compartment.

In the case of motor control centres, separate set of terminals shall be provided in the cable way for connecting motor power factor capacitor on the outgoing side of the starter. The cable way shall have facility for accommodating this cable and its termination.

Wherever control wiring has to be taken from the board to external points, adequate number of suitably rated terminals shall be provided for terminating the control cables. Facility shall be provided for accommodating and termination of these cables in the cable ways.

Facilities shall be available inside the cable alley for strapping the cable cores at regular intervals so that the cable connections at the terminals will be free of the weight of the Cables / cable cores and also to properly segregate the different cables / cable cores.

All the terminals in the cable alley shall be numbered for identification. The terminals shall be colour coded based on the colour coding of the bus bars to which they are connected. Power and control cable termination facilities shall be well- segregated.

Segregation facility shall be provided for all cables working at different voltage systems.

The cable alley shall be effectively segregated from all the surrounding compartments housing live parts. Facility shall be provided for termination of the cables both at the top and bottom of the cable.

The switchboards shall be supplied without cable glands and sockets unless otherwise specified.

Clearances

The minimum clearances between conductors and between conductors and earthed metal shall be as follows:

- | | | |
|------------------------------|---|------|
| a) Between phase | - | 20mm |
| b) Between phase and neutral | - | 20mm |
| c) Between phase and earth | - | 20mm |
| d) Between neutral and earth | - | 20mm |

Operating Heights

The maximum height of any operating handle/ knob/ button shall not be more than 1250 mm measured from the bottom of the board. The maximum height of the panel shall not exceed 2200mm. As far as possible, all the indicating instruments shall be mounted at a height of not more than 1800mm measured from the bottom of the board.

Moulded Case Circuit Breakers

Moulded case circuit breakers shall conform to IS/IEC 60947-2. Moulded case circuit breakers shall have breaking capacity as specified in the schematic drawings. MCCBs shall be provided with operating rotary handle and padlocking facility in open and closed positions. MCCBs shall be provided with adjustable over current setting, auxiliary switches, alarm switch, shunt trip facility and under-voltage trip. Indication of the handle positions shall be provided on the cover plate. MCCBs shall also be provided with ON and OFF LED type indicating lamps. MCCBs shall have microprocessor /thermal magnetic based protection as per schedule and schematic drawings. Number of poles shall be as per schematic drawings.

Installation

It should be possible to terminate Aluminium cable of required size for the current carrying capacity. The requisite size should be made available by means of extended terminals (as a standard offer) in case the direct terminals are not of adequate size. Adequate phase to phase clearance has to be ensured in case of extended terminations.

Construction

Operating mechanism shall be of the quick make/ quick break type, with the speed of operation independent of the operator, and mechanically trip free from the operating handle so as to prevent the contacts from being held closed against short-circuit and overload conditions. The operating mechanism shall be constructed to operate all poles in a multi-pole breaker simultaneously during opening, closing and tripping conditions.

The trip unit shall be of full magnetic (dash-pot) or thermal magnetic type. It shall not require any external power supply to operate the tripping mechanism. The breakers shall be operated by a toggle, which shall clearly indicate the three positions ON, OFF and TRIPPED. If required, the breaker will be equipped with rotary handles.

The breaking and extinction of the electrical arc shall be achieved by means of non-welding contacts and an arc chute surrounding these contacts.

If required, all electrical accessories shall be fitted by manufacturer to avoid tampering at site.

Switches and Fuse Switches

All switches and fuse switches used in the boards shall be of air-break, heavy duty, double-break, load-break type with quick break and quick make features and shall conform to IEC 60947-3. They shall be of front-operated type. The fuse switches shall be capable of withstanding the fault current which would flow through them without damage. If required, CPRI test certificate to prove this capability shall be furnished by the contractor.

Switch handle shall have the facility to be locked in closed and open positions of the switch.

The switches and fuse switches shall be installed in the compartments in such a manner that their live parts will not be accessible during normal working inside the compartment. The front door of every compartment housing a switch or fuse switch shall be interlocked with the switch / fuse switch in such a manner that the door can be opened only after the switch is opened that the switch / fuse switch cannot be closed when the door is in open position. It should, however be possible to intentionally defeat this interlock for inspection and testing purposes. Parts of the switch/fuse switch, which remain live even after the switch is opened, shall be effectively shrouded against accidental contact. Such shrouds shall be suitably marked to indicate that they cover live parts. Only FRP sheets or moulded components shall be used for such shrouding. No hylam is permitted. The shrouding sheets shall have enough thickness and rigidity so that it will not be flexible under normal pressures encounter. It should not be flexible under normal pressures encountered during assembly, erection, operation, inspection and maintenance.

The interconnection between bus bars and switches/fuse switches shall be kept as short as possible. The interconnecting conductors shall be rated for the full current rating of the switch/fuse switch. The interconnecting conductors shall be well-insulated, well-segregated and well-supported. The interconnections shall be mechanically rigid.

Fuses shall be of HRC cartridge type, mounted on plug-in type fuse bases having a short-circuit rating of not less than 80kA. Fuses shall be provided with visible operation indicators to show that they have operated. All accessible live connections shall be adequately shrouded, and it shall be possible to replace the fuses when the circuit is live without danger of contact with live parts. Insulated fuse pulling handle shall be supplied with each board.

Sufficient and accurate indication shall be provided on the door of the compartment to know whether the switch/fuse switch is in open or closed position.

Rotary cam type switches shall not be used in the boards except for control and indication circuits.

The ratings of the fuses shall be as per the actual requirements. One set of spare fuse links shall be provided for each fuse switch as per the actual requirements. The cost of the spare fuse links shall be included.

Installation and Auxiliaries

The switches should be panel mounting type. The switches should come along with an operating handle and padlock as standard. Phase barriers for all switches should be available as standard. Terminal shield up to 63A should be available as standard. Length of operating shaft should be adjustable continuously. This feature should come as a standard. The switches should be able to take Aluminium termination.

Copper conductors. Following shall be the minimum sizes of copper conductor for control cables:

Voltage circuits -

1.5 Sq.mm Current transformer circuits - 2.5 Sq.mm

The control wiring shall be segregated from wiring of differing voltages. Voltages transformer circuits and current transformer circuits shall be segregated.

The wiring shall be carried out using PVC wiring channels of required sizes. Where channels cannot be used, the wiring shall be neatly bunched and routed. Along the route, the wiring shall be supported at required intervals.

Adequate numbering by ferrules shall be provided for easy identification of the wires.

Control Supply

If required, for control circuits within the board shall be provided by the client, unless otherwise specified. The board shall have facility for accepting the main incoming control supply cable. The entry shall be adequately segregated from circuits of differing voltages. The control supply shall be controlled by means of an adequately rated, heavy duty, load break fuse switch fitted with protective fuses.

Earthing

An earth bus of copper conductor shall be run across the full length of the board to which all the non-current carrying metal parts of the board shall be effectively earthed. The earth bus shall have facility at both ends for being connected to the external earthing system. Such points of connection on the earth bus shall be easily accessible. The size of the copper earth bus shall be 25 x 3mm unless otherwise specified.

Labels

The board shall be labelled using plastic/bakelite engraved designation label. 415V danger label as per relevant standard specification shall be affixed on the board.

The label bearing name of the board shall have a minimum width of 40mm. Every compartment shall be labelled for identification using labels of minimum width of 25mm. All indicating lamps, control switches, push buttons, etc; shall also be labelled for identification. Sizes, type and number of cables connected to each compartment shall also be mentioned in the label on the respective compartment.

All components such as current transformers, meters, contactors, etc. mounted inside the board shall be mounted in such a manner that their name plates are easily visible

for reading. Name plate details of these components shall be fixed on the inside of the door/cover of the related compartment.

Maintainability

The board shall be so designed and constructed that it shall be possible to carry out all the routine inspection, maintenance, repairs and replacement jobs easily and expeditiously so that down-time is reduced to the minimum. All replaceable parts shall be easily accessible for removal and replacement.

Packing

The boards and their parts and components shall be packed to prevent any damage, deterioration or injury to them during transit.

The packing shall be of weather-proof quality so that even if the packages are to be stored for comparatively long periods out of doors no damage or deterioration will be caused to the contents of the package.

Adequate handling instructions shall be given on the packages. Movement of all internal parts shall be blocked by providing suitable transit packings.

Operation and Maintenance Instructions

One set of following documents relating to all switchgear, protective devices and meters shall be supplied along with the board:

- Technical details including wiring diagrams
- Installation, testing and commissioning manuals
- Operation and maintenance instructions
- Spare parts catalogue

Spares

The offer shall include a list of spares which would become necessary for the first three years of services of various equipment(s) contained in the board along with the price.

Supply, Installation and Commissioning of 415v Switch Boards - scope of Work

Supply, Store, handle, assemble, install, test and commission medium voltage switchboards. All switchboards/panels supplied shall be type tested and certifications shall be produced during supply at site. The scope of Contractor's work will include:

- Supply, unloading the equipment from the carriers at site, Unloading the boards from the carrier, and shifting to place of storage and properly storing till the boards are required to be installed. All transporting and handling of the boards at site, inspection of the boards immediately on receipt at site for any defect/ damage/ discrepancy/shortage, reporting and taking prompt action to attend to the defect/ damage/ discrepancy/shortage.
- Re-packing the switchboards and storing them till they are required for installation, assembling and installation of the boards at the location provided and as per the manufacturer's instructions and in conformity with the relevant codes, rules and regulations, supply of accessories required for erection such as bolts, nuts, washers, consumables, etc. and pre-commissioning preparations, checks and

tests.

- Contractor shall be responsible for the safety of all the equipment till these are tested. Commissioned and handed over by contractor to the Client, Contractor shall also be responsible for any defect/damage that may be caused to the equipment due to defective handling/ storage/ erection/ testing/ commissioning.

Inspection of Receipt

The switchboards shall be inspected immediately on receipt. The packages shall be opened and all the contents examined to ensure whether any of them is damaged or defective in any manner or whether there is any shortage or discrepancy in the supplies. All such damages, defects, shortages and discrepancies shall be promptly reported to the concerned parties. Immediate action shall be taken to attend to any damage. Defect, discrepancy and/or shortage noticed.

Storage

The switchboards and their parts required for immediate use shall be properly re-packed and stored in a clean, dry, airy and secure place indoors. The area of storage shall be free from dust and corrosive gases.

Location of Installation

Irrespective of the locations shown in the drawings, the switchboards shall be installed only after confirming the locations in consultation with Client. The switchboards shall be easily accessible to authorized persons.

Clearances as per the relevant standards and as per the practice approved by the Inspectorate shall be maintained while fixing the location of the various switchboards.

Assembly and Erection

The contractor shall furnish to the Client all necessary drawings to carry out the construction of cable ducts required for the various switchboards. The correctness of construction of the cable duct, foundation, etc. shall be checked before commencing the erection.

Erection and assembly of the switchboard shall be carried out in accordance with the standard practices, manufacturer's instructions, Indian standard specifications and codes of practice and Client's instructions. After erecting and assembling the various sections, parts and components of the switchboard, the internal wiring and connections shall be carried out as per wiring drawings or as per standard practice. The connections shall be clean and tight. Necessary tests shall be carried out to ensure the correctness of wiring and connections.

After completion of the above works, the interior of the entire boards shall be checked and thoroughly cleaned and freed of all dust, moisture, foreign materials, etc. The working of the various mechanical parts shall be checked for smooth and correct operation.

The location and method of installation of the switchboard shall be carried out with due attention to facilitate easy accessibility for maintenance.

Pre-Commissioning Procedures

After completion of erection and assembly of the switchboard as above, the switchboard shall be got ready for testing and commissioning. Immediately prior to testing, the interior of the switchboard shall be thoroughly cleaned and dried. All the power, metering, protective and control circuit wiring shall be checked for correctness. All connections shall be checked for tightness and cleanliness. Mechanical operational of all the parts shall be checked.

The following pre-commissioning tests and checks shall be carried out on the boards:

- a) Visual inspection of boards for complete and correct assembly, internal wiring and connections and erection in accordance with the drawings and specifications.
- b) Checking of mechanical operations of the switchgear and control gear such as closing, opening, drawing out, plugging in, etc.
- c) Checking of the functioning of safety interlocks, safety shutters and other safety features.
- d) Operational and accuracy tests on the protective gear such as relays, annunciation system, indicating lamps, etc. by injecting the required voltage/current into the circuits.
- e) Operation and accuracy tests on the meters by injecting suitable voltage /current into the circuits.
- f) Setting of protective devices such as relays
- g) Insulation resistance measurements of power circuits
- h) Insulation resistance measurements of control circuits
- i) Earth resistance of the body of the board.

All the testing/commissioning procedures shall be carried out in the presence of Consultant/client and the test results shall be recorded and furnished to Client/Engineer in charge/Consultant.

Testing Certificates

All the testing certificates as per IE rules shall be furnished to KINFRA and/or Engineer in charge.

Operation and Maintenance Instructions

One set of following documents relating to all switchgear, protective devices and meters shall be supplied along with the board:

- Technical details including wiring diagrams
 - Installation, testing and commissioning manuals
 - Operation and maintenance instructions
- The connections to the busbars shall be by solid copper links.

The DB's shall have phase / Neutral / Earth terminal blocks for termination of incoming and outgoing wires

All the device wires and terminal blocks within the board shall be clearly identified by durable and legible tags corresponding to those in applicable drawings. All wiring shall be easily identified by ferrules (interlocking type) accessible for maintenance checks.

Terminal blocks should be suitable for termination of conductors / cable of required size but minimum rated cross section of the terminal block should be 6 sq.mm.

Terminal block shall be made of flame retardant polyimide material. Coloured terminal blocks & FRLS wires shall be used for easy identification of RYB phases, neutral and earth.

The design of the Distribution board shall be such that the MCBs can be mounted without additional wiring.

All the low voltage internal wiring of the distribution boards shall be of 1.1KV grade stranded copper conductor, FRLS PVC insulated, PVC sheathed wires of core size 2.5 sq.mm for control wiring.

Miniature Circuit Breaker (MCB):

The MCBs shall be of the thermal-magnetic type and shall have a short circuit rating of not less than 9KA, suitable for DIN rail mounting and shall be ON in the up position and OFF in the down position of the operating knob.

The Miniature circuit breaker (MCB) shall be heat resistant, moulded type designated, manufactured as tested as per (IS8828).

The MCB shall have inverse time tripping characteristic against overloads and instantaneous trip against short circuit.

Current Circuit Breaker (RCCB/RCBO):

Residual Current circuit breaker shall be 415 / 240V, 4 / 2-pole current-operated type, with a sensitivity of 30 milliamps in 30 milliseconds or less tripping time & with a sensitivity of 100 milliamps in 20 milliseconds or less tripping time, suitable for DIN rail mounting inside MCB DBs.

The RCBO/RCCB shall work on direct-current operating principle using core balance current transformer.

The unit shall have a test button for testing its function. The RCBO/RCCBs shall not have a bypassing arrangement.

Fuse Switch Unit / Change Over Switch:

The fuse switch unit shall be of continuous rating and of heavy-duty load break type. The unit shall be housed in dust proof 2 mm thick sheet steel enclosure having top and bottom knockout entries. The unit shall be suitable for GI pipe / PVC conduit / metal conduits / cable entry and have adequate wiring space.

The switch-operating handle shall be interlocked with the door such that it opens only when the switch is in OFF position. The unit shall be provided with sealing facility and shall contain HRC fuses with ratings as per the drawings.

LIST OF APPROVED MAKE OF MATERIALS

Sl. No	Details of Materials / Equipment	Manufacturer's Name/Brand
A	Electrical Work	
1	LT Cables	<ul style="list-style-type: none"> a. Havells b. KEI c. RR Kable d. Polycab e. RPG f. Gloster g. Bonton h. Finolex
2	MCB DB	<ul style="list-style-type: none"> a. ABB b. Siemens c. L & T d. Legrand e. Schneider f. Havells g. Indo Asian
3	Cable Glands	<ul style="list-style-type: none"> a. Comet b. Prabhat c. Dowells d. HMI e. Crompton f. Siecop g. Jainson
4	CTS/PTS	<ul style="list-style-type: none"> a) KAPPA b) Pragathi c) Indus d) Kalpa e) C & S
5	PVC Conduits & Flexible Hose with Accessories	<ul style="list-style-type: none"> a. Universal b. Avonplast c. AKG d. Aeroplast e. Balco f. Ashoka g. Precision h. Konsel i. Circle Arc
6	Push Buttons/ Indicating Lamps LED	Lauritz Knudsen / Siemens / Schneider /Teknik.
7	Switch Fuse Units with HRC fuses	Lauritz Knudsen / Siemens / ABB / Merlin Gerin

8	Compression glands and Lugs	Dowells/ Comet.
9	Cu/ Al (Crimping type) Cable Lugs	Dowells/ Comet.
10	MS Conduits	Bharath/ JK Tupe / Precision.
11	PVC Insulated FR Cu. Wires	Lauritz Knudsen/ KEI / Finolex / Anchor
12	MCCB/MCB	Lauritz Knudsen/ ABB/Schneider/Siemens
13	Selector Switches	Lauritz Knudsen/Salzer/Kaycee/Seimens

1. All other relevant forms shall be in the format prescribed CPWD Manual.
2. **All Statutory approvals both initial & final wherever necessary for the execution of work from the authorities concerned shall be obtained by Contractor at his own expense. However statutory fees will be reimbursed on submission of receipts.**
3. **Important Dates**

Last Date of submission -	26/10/2024, 3.00PM
Tender Bid Opening -	26/10/2024, 3.30PM

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Tender No : KINFRA/PCP/ 01/ 2024-25

PRICE BID

Name of Work: Supply, installation, testing and commissioning of outdoor front double door LT panels for the CSSs at KINFRA Petrochemical Park, Ambalamugal

SI No.	Description	Qty	Unit	Rate	Amount
1	Design Fabrication, Supply, Installation, Testing and Commissioning and Positioning of cubicle type dust and vermin proof Floor mounted front operated Panel Board with double door canopy, with adequate foundation as per given specification and electrical inspectorate standard, made out of 16 SWG CRCA sheet with IP56 protection, fully compartmentalized, doors with concealed hinges, Rubber beeding, Panel lock with all necessary interlocks, earthed doors, Switch mounted in conformity with Electrical Inspectorate standards. Entire sheet work will be treated under seven tank process and then powder coated with grey matt finish(Shade RAL 7035). Clear coat: No, Earthing: Cu, Lifting Hooks Provided. MSB Panel(Type 1):- Incomer: - 400A, 36kA, 4P MP MCCB - 1 nos RYB Indication with suitable control MCB's - 1set MFM with matching CT's -1 set 50kA SPD – 1 nos Outgoings 80A TPN MCCB - 2 nos 320A TPN MCCB - 2 nos(Provision Only) 160A TPN MCCB - 2 nos(Provision Only)	1	Job		
	Total				

* Rates and amounts quoted are excluding GST

UNDERTAKING

I / We agree to carry out the above works, at the quoted rates of Rs.....

(.....
.....)

and will complete the work at the terms and conditions mentioned in the tender.

Place: **Signature of Contractor** :

Date : **Full name and address** :