TENDER DOCUMENT

FOR SUPPLY HT MULTI PANEL

FOR DREAMS MALL, KOTTIYAM, KOLLAM

TENDER NO: DREAMS MALL/2022 DTD 02/03/2022

CLIENT

M/s DESINGANADU RAPID DEVELOPMENT & ASSISTANCE CO-OP SOCIETY LTD, Q – 1666,

KOTTIYAM P.O., KOLLAM, KERALA.

ARCHITECTS

M/s ABHILASH ARCHITECTS,

NEAR ART OF LIVING ASHRAMAM,

KOLLAM, KERALA, INDIA -691012

Address: - DESINGANADU RAPID DEVELOPMENT & ASSISTANCE CO-OP SOCIETY LTD, Q – 1666,

KOTTIYAM P.O., KOLLAM, KERALA. 691571

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E-mail:-dreamsmall.engineering@gmail.com

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NOTE:

Vendor/Tenderer/Contractor - here means Approved Makers.

Architects – here means M/s Abhilash Architects

Client – M/s Desinganadu Rapid Development & Assistance Co-op Society Pvt. Ltd.

SECTION A

NOTICE INVITING TENDER

M/s Desinganadu Rapid Development & Assistance Co-op Society Pvt. Ltd. is inviting tender for "Supply for HT Multi Panel for DREAMS MALL, KOTTIYAM, and KOLLAM".

The Due date of Submission of Tender is 11/04/2022.

i) The tenderers are required to submit their tender as per the information mentioned in the tender documents and if there is any deviation in tender specification, the same shall be submitted separately along with the tender documents. Tenderers are required to fill the tender technical specification sheets without fail.

ii) The successful Tenderer will be required to enter into a formal agreement with Client after the issue of Letter of Intent.

iii) The tender hard & soft copies should be sent to M/S Desinganadu Rapid Development & Assistance Co-op Society Pvt. Ltd. (dreamsmall.engineering@gmail.com) by 16 00Hrs on or before 11/04/2022.

iv) Tenders shall be valid for days (ninety) from the date of opening of tender.

v) Client reserves the right to accept or reject any tender and also shall modify the tender dates without assigning any reason depending upon the site conditions. Further, the client does not bind himself to accept the lowest tender.

vi) The tender should be signed by an authorized official of the company. The tender should be handed over in a sealed cover.

vii) Client reserves the right to increase or decrease the no. of units proposed before finalization of the order or reserves the right to nullify the tender if needed without assigning reasons.

SECTION B

Terms of Payment AND Taxes & Duties:

1. Terms of Payment:

a. 10% of the Contract Value shall be payable as advance immediately upon signing the Contract and against the submission of Bank Guarantee.

b. 70% of the Contract Value shall be payable against delivery of material at site/Letter of Credit as per rules

c. 10% of the Contract Value shall be paid after completion of testing & commissioning and handing over of equipment.

d. 10% of the Contract Value shall be payable as retention after defect liability period of 12 months. However, this amount can be released against the submission of retention Bank Guarantee.

2. Taxes & Duties:

- The prices are inclusive of all taxes, duties, levies prevailing on the date of this proposal. And transport charges etc.

SECTION C

GENERAL SPECIFICATIONS

CONFORMITY WITH STATUTORY ACTS, RULES, REGULATIONS, STANDARDS AND SAFETY CODES

Indian Electricity Act and Rules

All electrical works in connection with installation of electric sub-stations shall be carried out in accordance with the provisions of Indian Electricity Act, 2003 and the Indian Electricity Rules, 1956 amended up to date. Wherever I.E. rule numbers have been indicated, they are based on I.E. Rules, 1956 amended up to date.

Indian Standards

The transformers and their installation shall conform to relevant Indian standards amended up to date.

Safety Codes and Labour Regulations

In respect of all labour employed directly or indirectly on the work, the tenderer, at his own expense will arrange for the safety provision. In case of default, the client shall be at liberty to make arrangements and provide facilities as aforesaid and recover the cost from the tenderer. The tenderer shall provide necessary barriers warning signals and other safety measures to avoid accidents while installation, testing and commissioning.

Nothing in these specifications shall be construed to relieve the tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with applicable statutory regulations and safety codes in force from the safety angle.

WORKS TO BE ARRANGED BY THE CLIENT

Unless otherwise mentioned in the tender specifications the following works shall be carried out by the client/contractor.
Construction of sub-station building. The tenderer should select such equipment for installation as can be properly installed in the spaces shown in specification drawings. While no guarantee can be given minor modification required by the tenderer if mentioned in the tender or intimated immediately after the receipt of tender shall be carried out if structurally possible.

Cable trench, entry pipe for cable, manholes for drawing of cables, manhole covers etc. as per requirements.

Provision of storage space at site.

WORKS TO BE DONE BY THE TENDERER

In addition to supply, installation, testing and commissioning of transformer as per specifications, the following work shall be deemed to be included within the scope of work, to be executed by the tenderer:
Provision of supports / clamps for equipments, cables etc. wherever required.

Small wiring, inter-connection etc. inclusive of all materials and accessories, necessary to comply with the regulations as well as proper and trouble free operation of the equipment.

Tools and tackles required for handling and installation.

Necessary testing equipments for commissioning.

Watch and Ward of materials and/or installation and equipments till their handing over to the client.

SITE CONDITIONS

All the equipments and their installation shall be suitable for the environmental conditions encountered at the location as indicated in Appendix II.

INSPECTION OF SITE AND COLLECTION OF DATA

The tenderer shall be deemed to have examined the tender documents, detailed specification, data etc. and to have visited the site or ascertained all relevant details for offering suitable equipments/ installation.

EXTENT OF WORK

The scope of work shall consist of cost of all materials, labour i/c supervision, installation, calibration, adjustments as required for commissioning of the sub-station. The term complete installation shall mean, not only, major item of the plant and the equipments covered by these specifications, but also, incidental sundry components necessary for complete execution and satisfactory performance of installation with all labour charges, whether or not specifically mentioned in the tender documents, which shall be provided by the tenderer at no extra cost.

COMPLETENESS OF TENDER

All fittings, unit assemblies accessories, hardware foundation bolts, terminals blocks for connections, cable glands and miscellaneous materials and accessories of items of work which are useful and necessary for efficient assembly and working of the equipment shall be deemed to have been included within the scope of the work in the tender and within the overall details for complete item whether they have been specifically mentioned or not.

DATA MANUALS AND DRAWINGS TO BE FURNISHED BY TENDERER

After Award of Work:
The tenderer shall submit the following drawing within a fortnight of the award of the work or as specified in tender document which shall prevail, for approval by the consultant.

- General arrangement or location drawing of the equipment complete with dimensions and clearances.

- Schematics & wiring diagram including control wiring.
- Any other drawing or data that may be necessary for the job.

Before Commencement of Installation:

The tenderer shall also furnish 3 copies of detailed installation, operation and maintenance manuals of manufacturer for all items of equipment together with all relevant data sheet, spare parts catalogues, repairs, assembly and adjustment procedure etc. in triplicate.

QUALITY OF MATERIALS AND WORKMANSHIP

All parts of equipment shall be of such design, size and material so as to function satisfactorily under all rated conditions of loading and operation. All components of the equipment shall have adequate factors of safety. Materials/components which are not conforming to standards laid down by Bureau of Indian Standards (BIS) shall not be approved.
The entire work of fabrication, assembly and installation shall conform to sound engineering practice and on the basis of "fail safe" design. The mechanical parts subject to wear and tear shall be of easily replaceable type. The construction shall be such as to facilitate ease of operation, inspection, maintenance and repairs. All apparatus shall also be designed to ensure satisfactory operation under working conditions as specified.

INSPECTION, TESTING AT MANUFACTURERS WORKS

The tenderer will be required to furnish such facilities as will be necessary for inspection of the equipment before dispatch at the manufacturer's works and also for witnessing such tests, at the works, if so required by the client. The tenderer shall furnish information for this purpose and will also give sufficient notice regarding the dates proposed for such test to Inspection agency.

TEST CERTIFICATE

Copies of all documents for routine, acceptance and type test certificates of the equipment carried out at the manufacturers premise shall be furnished along with supply of the equipment.

DISPATCH OF MATERIALS AND STORAGE

The tenderer shall commence work as soon as the drawings submitted by him are approved. The tenderer should dispatch all materials to site in consultation with the client where suitable storage accommodation may be made available to him temporarily. For this purpose the programme of

dispatches of materials shall be framed keeping in view the building progress so that suitable storage accommodation could be made available to the tenderer.

COORDINATION WITH OTHER AGENCIES

The tenderer shall coordinate his work and cooperate with other agencies by exchange of all technical information like details of foundation if required, weight, over all dimensions, clearance and other technical data required for successful and proper completion of his portion of the work in relation to the work of others without any reservation. No remuneration should be claimed from the client for such technical cooperation. Care shall be taken not to damage the water proofing done in the case of substations constructed below ground level. If any unreasonable hindrance is caused to other agencies and any completed portion of the works has to be dismantled and redone for want of the cooperation and coordination by the tenderer during the course of work, such expenditure incurred will be recovered from the tenderer during the course of work, if the restoration work to the original condition of specification of the dismantled portion of the work was not under taken by the tenderer.

CARE OF BUILDINGS

Care shall be taken, while handling/ installing the equipment to avoid damage to the building. On completion of the installation, the tenderer shall arrange to repair all damages to the building caused during plant installation so as to bring to the original condition. He shall also arrange to remove all unwanted waste materials from substation room and other areas used by him.

PAINTING AND PROTECTION

All damages to painting during transport and installation shall be set right to the satisfaction of the client before handing over. All structural frame work for support of various items of equipment shall be given the final coat of paint of approved shade at site after erection is complete.
Additional protection measures against corrosion shall be provided when installed in special environment.

TRAINING OF CLIENT STAFF

The operation and maintenance staff of the client shall be associated with the manufacturer personnel during the installation, testing and commissioning of the equipments.

COMPLETION DRAWING

Three sets of completion drawings comprising the following shall be submitted by the tenderer while handing over the installation:

- Equipments layout drawing(s) giving complete details of the entire equipments.
- Electrical drawings for the entire electrical equipments showing cable sizes, equipment capacities, switch-gear's ratings, control components, control wiring etc.

FINAL INSPECTION AND TESTING

When the installation is complete, the tenderer shall arrange for inspection and testing of the installation. Test results obtained shall be recorded. The installation shall not be accepted until it complies with the requirement of these Specifications. The transformer installation shall be got inspected by the tenderer from local licensee and/or Electrical inspectorate and their clearance taken before energizing the Sub Station. All the observations/ deficiencies pointed out by the inspecting authorities shall be complied with by the tenderer on priority. The client shall render all help and pay mandatory charges to local licensee and/or Electrical inspectorate, if any, in this regard.

GUARANTEE

The tenderer shall guarantee the entire installation as per specifications. All equipments shall be guaranteed for **24 months** from the date of acceptance against unsatisfactory performance or break down due to defective design, manufacture and installation. The installation shall be covered by the conditions that whole installation or any part thereof found defective within **24 months** from the date of taking over shall be replaced or repaired by the tenderer free of charge as decided by the client. The warranty shall cover the following:-

- Quality, strength and performance of materials used.
- Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- Satisfactory operation during the maintenance period.
- Performance figures and other particulars as specified by the tenderer under schedule of guaranteed technical particulars.

AFTER SALES SERVICES

The tenderer shall ensure adequate and prompt after sales services in the form of maintenance personnel and spares as and when required with a view to minimizing the break down period. Particular attention shall be given to ensure that all spares are easily available during the normal life of installation.

SECTION D

TECHNICAL SPECIFICATION

This Specification covers the design, material selection, constructional features, manufacture, inspection and testing at the works, packing, transportation, delivery, installation, testing and commissioning of the Indoor type switchgear.

The Panel board shall be of **indoor** type, having the incoming sectionalisation and outgoing switch gears as per IS 13118 : 1991 of VCB, IEC 62271-100 for Breakers .The degree of enclosure protection shall be IP-43(INDOOR). Detailed requirements shall be in accordance with the schedule of works.

RATING:

All panels assembled to form a board shall be suitable for the nominal operation voltage and rupturing capacity as specified. They should be rated as specified with a minimum of 800 Amps as required and suitable for operation on 11 KV, 3 phase 50 Hz system. Type test certificate for the breaking capacity of the panel shall be supplied. A circuit breaker for a given duty in service is best selected by considering the individual rated values required by load conditions and fault condition.

TYPE:

The HV Panel Board shall be metal clad, indoor, floor mounting, free standing type. It shall be totally enclosed dust, damp and vermin proof.

GENERAL CONSTRUCTION:

Separately earthed compartments shall be provided for circuit breakers, bus bars, relay & instruments, CT&PT and cable boxes, fully and effectively segregating these from one another so that fault in any one compartment do not cause damage to equipment(s) in other compartment(s).

The housing shall be of bolted construction to ensure compact and rigid structure, presenting a neat and pleasing appearance. The sheet steel used should not be less than 2 mm thick.

The panels shall be bolted together to form a continuous flush front switch gear suitable for front operation of board and for **extension at both ends.**

DESIGN ASPECTS:

The HT panel board shall be designed such that the switchgear, instruments, relays, bus bars, small wiring etc. are arranged and mounted with due consideration for the following:-

- Facility for inspection, maintenance and repairs of testing terminals and terminal boards for ease of external connection.
- Minimum noise and vibrations.
- Risk of accidental short circuits and open circuits.
- Secured and vibration proof connections for power and control circuits.
- Risk of accidental contact and danger to personnel due to live connections.
- Mountings at approachable height.

SITE CONDITIONS:

Temperature : Maximum 40 Deg. C

Minimum 27.8 Deg. C

Humidity : Not more than 58% at max temperature

Altitude : Less than 3 meters above MSL

CIRCUIT BREAKER:

REFERENCE STANDARDS:

Circuit Breaker	IS/IEC : 62271-1 2007
Metal enclosed Switchgear	IS: 3427, IEC: 298, IEC:694
Current Transformers	IS/ IEC:61869-2
Potential Transformers	IS/IEC:61869-3
Guide for Marking Bus bars, main connection and auxiliary wiring	IS:5578, IS:11353

Busbar support insulators	IS:2544, IEC:273
Degree of Protection	IS/IEC:60529, IS:3231, IEC:255
Electrical Indicating Instruments	IS:1248, IEC:51
High Voltage Fuses	IS:9385, IEC:282
AC Electricity Meters	IS:722
Copper Bus bars	IS:4171, IEC:694
Offload isolators	IEC:129
Code of Practice for Phosphating Iron and Steel	IS:6005
HRC Fuses	IS:9224

CONSTRUCTIONAL FEATURES:

The switchgear shall be fully draw-out(VCB), metal clad type and shall have Vacuum Circuit breaker. **Provision shall be done for accommodating bi directional EB meter with necessary 0.2S accuracy class CT-PT units (if mentioned in the schedule of works)**. However voltmeter, ammeter etc shall be provided. One vertical panel shall include one feeder. Extension chambers at rear portion. Shall be considered for termination of large size / number cables, if required. Necessary dummy cubicles complete with horizontal bus bars, space heaters, power, control and **annunciation**, bus bars / cables shall be included.

The breaker carriage shall be fabricated from steel, providing a sturdy vehicle for the circuit breaker and its operating and tripping mechanism. The carriage shall be mounted on wheels, moving on guides, designed to align correctly and allow easy movement of the circuit breaker and for removing the carriage for inspection and maintenance purposes. Vacuum interrupters shall be hermetically sealed and shall be designed for minimum contact erosion, fast recovery of dielectric strength, maintenance free vacuum interrupter, suitable for auto-reclosing. The drive mechanism shall preferably be provided with facility for pad locking at any position namely, "Service", "Test" and "Fully Isolated". It should be possible for testing the circuit breaker for its operation without energizing the power circuit in the "Testing" position. The contacts shall be made only after the breaker is inserted into service position. Interlocking should prevent contacts from being disconnected if circuit breaker is tried to be moved from service position.

The circuit breaker panels shall be complete with the following:

- Racking in / Racking out mechanism.
- Isolating plugs and sockets.
- Mechanical inter-locks and safety shutters.
- Mechanical ON/OFF indicator.
- Minimum of 6 NO and 6 NC Auxiliary contacts directly operated by the circuit breaker. Additional NO & NC contacts can be provided with auxiliary contactors.
- Anti condensation space heaters suitable for operation on 240V, 1□ 50 Hz A.C. for each panel wherever specified.
- Suitable tripping arrangement.

Switchgear Cubicles and Bus Bar Ratings Frequency	11 kV, 3Ph, 50Hz
System Neutral Earthing	Non-effectively earthed
Maximum system voltage	12kV
One Minute Power Frequency Withstand Voltage kV (rms)	28kV
1.2/50 Micro Sec. Impulse withstand Voltage kV (peak)	75kVp
Short circuit withstand capacity 3 sec. at rated Voltage kA (rms)	26.3kA
Reference ambient temperature (C)	40
Material of Bus bars	**Aluminium**
Construction Details	
Thickness of Sheet steel	CRCA 2mm
Enclosures, Doors & Covers	CRCA 2.5mm
Bottom Sheet metal plate thickness	CRCA 2.5mm

Degree of Protection	**IP 43**
Material of Earthing Bus	**Copper**
Painting	Light Grey shade RAL 7032

There shall be 'Service', 'Test' and 'Fully withdrawn' positions for the breaker. In the 'Test' position the circuit breaker shall be capable of being tested for operation without energizing the power circuits, i.e. the control circuits shall remain undisturbed while the power contacts shall be disconnected. Separate limit switches each having a minimum of 6 'NO' + 6 'NC' contacts shall be provided for both 'Service' and 'Test' positions of the circuit breaker. These contacts shall be rated for 10 amps, 240V AC

Circuit breaker shall have completely sealed interrupting units for interruption of arc inside the vacuum. It shall be possible to isolate easily the vacuum interrupter unit from the breaker operating mechanism for mechanical testing of the interrupter to check loss of vacuum.

The circuit breaker shall be complete with surge arrestors to provide protection to the equipment controlled by the breaker, against switching surges. Over voltage produced by the circuit breaker during switching off induction motor or switching on / off of transformer shall be limited to 2.5 times the peak value of rated phase to neutral voltage. Surge absorbers of either Z or Cr type with non-flammable, non- toxic liquid filled capacitors shall be used and located in switchgear cubicle if the over voltage limit exceeds.

CIRCUIT BREAKER OPERATING MECHANISM:

Circuit breaker shall be power operated by a motor charged spring operated mechanism. It shall be strong, rigid, positive and fast in operation to ensure that the pole discrepancy does not exceed 10ms.

Mechanism shall be such that failure of any auxiliary spring shall not prevent tripping and will not cause tripping or closing operation of the power operated closing devices. When the circuit breaker is already closed, failure of any auxiliary spring shall not cause damage to the circuit breaker or endanger the operator.

The closing release shall operate correctly at all values of voltage between 85% and 110% of the rated voltage. A shunt trip shall operate correctly under all operating conditions of the circuit breaker up to the rated breaking capacity of the circuit breaker and all values of supply voltage between 70% and 110% of rated voltage.

Auxiliary switches mounted on the fixed portion of the cubicles and directly operated from the breaker operating mechanism on each breaker having 6 'NO' and 6 'NC' potential-free contacts rated for 10 amp, 240V AC and 0.5 amp (inductive breaking) 240V AC shall be provided. The contacts shall be in addition to those utilized in control circuit of each breaker and shall be exclusively meant for EMPLOYER use in external interlocks and controls.

External auxiliary supply shall be made available for charging motors & heaters operation.

SPRING OPERATED MECHANISM:

Spring operated mechanism, shall be complete with motor of adequate rating, opening spring, closing spring with limit switch for automatic charging and all necessary accessories to make the mechanism a complete operating unit.

After failure of power supply to the motor, at least one open-close-open operation of the circuit breaker shall be possible.

OPERATING MECHANISM CONTROL:

Operating mechanism shall normally be operated locally, when the breaker is in "Service" position. Electrical tripping shall be performed by shunt trip coils. Provision also shall be made for local electrical control when the breaker is in "Test" position by a control switch on the switchgear cubicle door. Also, "Local / Remote" selector switch lockable in "Local" position shall be provided on the cubicle door. 'Red' and 'Green' indicating lamps shall be provided on cubicle door to indicate breaker close and open positions. Breaker "Service" and "Test" positions shall be indicated by separate indicating lamps on the cubicle door, in case mechanical indication of "Service" and "Test" positions are not available on the cubicle door.

BUSBAR:

The switch board shall be single bus bar pattern with air insulated encapsulated bus bars housed in a separate compartment, segregated from other compartments.

The bus bars shall be of high conductivity electrolytic copper rated as specified with a minimum rated current as specified. The bus bars shall be sized for carrying the rated and short circuit current without over-heating. Maximum bus bar temperature shall not exceed 95 degree C.

CURRENT TRANSFORMER:

The CTs shall conform to relevant Indian Standards. The design and construction shall be robust to withstand thermal and dynamic stresses during short circuits. Secondary terminals of CTs shall be brought out suitably to a terminal block which will be easily accessible for testing and terminal connections. The protection CTs shall be of accuracy class 5 P 10 of IS 2705- Part III-1992.

The metering CTs shall conform to the metering ratio and accuracy class 0.5 of IS 2705-1992 for incomer and class 1 for outgoing panels.

VOLTAGE TRANSFORMER:

A voltage transformer of burden not less than 25 VA and of proper ratio as specified shall be provided at the incoming panel.

The accuracy class for the VT shall be class 0.5 as per IS 3156 Parts I to III for incomer and class 1 for outgoing panels.

The transformer shall be of cast epoxy resin construction. It shall be fixed/withdrawable type. HRC fuses/ MCBs shall be provided on both HV and LV sides.

PROTECTION AND TRIPPING ARRANGEMENT

Protection

The Relays shall be microprocessor based numerical relays with O/L, E/F and S/C protection Tripping relay shall be used for tripping signal to the Shunt Trip Coil of Circuit Breaker operating on 24 V/ 30 V D C supply / Power pack / 110 V VT supply.

Relays

Over current Relays shall have adjustable setting for current from 50% to 200% and earth fault from 10% to 40% or 20% to 80%. These should be of manual reset type. All relays shall have a LED indicator which will indicate operation for each function. It shall be possible to reset it only by manual operation. The number and types of relays shall be as specified.

SMALL WIRING:

The small wiring shall be carried out with minimum1.5 sq. mm FRLS/ HFFR insulated copper conductor cables. CT wiring shall be done with minimum 2.5 sq mm wires with colour code: RYB, Gray for auxiliary DC circuits and Black for auxiliary AC circuits. The wiring shall be securely fixed and neatly arranged to enable easy tracing of wires. Identification tags shall be fitted to all wire terminals to render identification easy and to facilitate checking in accordance with IS 375. Necessary terminal blocks and cable entries shall be provided for RTD relay wiring, power supply etc.

METERING INSTRUMENT, PANEL ACCESSORIES (DIGITAL):

Metering

Energy metering shall be done either on the incomers and on the feeders.

Instrument Panels

The instrument panel shall form part of the housing. Relays, meters and instruments shall be mounted as per general arrangement drawings to be submitted by the tenderer. They shall be preferably of flush mounting type at a maximum height of 1800 mm.

Instrumentation

- A voltmeter of class 1.5 accuracy as per IS 1248 shall be provided at each incomer panel, with selector switch. The instrument shall be calibrated for the ranges specified.
- Energy meters of class 1.0 conforming to IS 722 (Part IX) and power factor meter of class of accuracy of 2 shall be provided, if specified.
- Ammeter of specified range of class 1.5 accuracy as per IS 1248 shall be provided at both incomer and outgoing panels along with necessary selector switches.
- Lamp indication shall be provided to indicate ON/ OFF (by red green respectively) of switch gear.
- Panel illuminating lamp.
- Mechanical indication for spring charged status. If possible an indicating lamp could be provided.
- Lamp indicating tripping at fault status.

- Healthy trip supply shall be indicated by clear lamp.
- Separate fuses/ MCBs shall be provided for lamps, heaters, voltmeters and other instrumentation etc. on each panel.
- Anti-condensation space heaters shall be provided, and shall be suitable for operation on 240 V, 1 phase, 50 Hz A.C. for each panel if specified.
- Where there is more than one incomer and bus sections, these shall be castle key interlocked as per interlocking scheme as specified.

CABLE BOXES:

Cable boxes shall be situated in a compartment at the rear / side of the housing as specified.

CABLE ENTRY:

Provision for top / bottom or such other side entry shall be made as per requirement with sufficient head room for cable termination. 3 mm thick removable gland plate shall be provided for cable termination.

EARTHING:

The earthing of the breaker body and moving portion shall be so arranged that the earthing of the non-current carrying structure to the frame earth bar is completed well before the main circuit breaker plugs enter the fixed house sockets.

The entire panel board shall have a common tinned copper earth bar of suitable section with 2 earth terminals for effectively earthing metallic portion of the panels.

INSTALLATION:

The installation work shall cover assembly of panels lining up, grouting the units etc. In the case of multi panels switch boards after connecting up the bus bar all joint shall be insulated with HV insulation tape or with approved insulation compound. A common earth bar shall be run preferably at the back of the switch board connecting all the sections for connecting the earth system. All protection, indications & metering connections and wirings shall be completed.

Where trip supply battery is installed the unit shall be commissioned, completing initial charging of the batteries. All relay instruments and meters shall be mounted and connected with appropriate wiring. Calibration checks of units as necessary and required by the licensee like CTs, VTs Energy Meters etc. shall be completed before pre-commission checks are undertaken.

TESTING AND COMMISSIONING:

Procedure for testing and commissioning of relay shall be in general accordance with good practice.

Commissioning checks and tests shall include in addition to checking of all small wiring connections, relays calibration and setting tests by secondary injection method and primary injection method. Primary injection test will be preferred for operation of relay through CTs. Before panel board is commissioned, provision of the safety namely fire extinguishers, rubber mats and danger board shall be ensured. In addition all routine megger tests shall be performed. Checks and test shall include following:

- Operation checks and lubrication of all moving parts.
- Interlock function checks.
- Continuity checks of wiring, fuses etc. as required.
- Insulation tests.
- Trip test and protection gear tests.
- The complete panel shall be tested with 5000 V megger for insulation between poles and poles to earth. Insulation test of secondary of CTs and VT to earth shall be conducted using 500 V megger.
- Any other tests as may be required by the Licensee / Inspector shall be conducted.
- Where specified, the entire switch board shall withstand high voltage test after installation.
- Any other test required by the client/consultant.

SECTION E

COMMERCIAL BID

One no. incomer 800A, 11kV, TP, 350MVA. rated Vacuum Circuit Breaker, One no outgoing 800A, 11kV, TP, 350MVA rated Vacuum Circuit Breaker and 3 no outgoing 630A, 11kV, TP load break switch. Switchgear shall be of Indoor approved make. Cubicle shall be compatible to integrate with BMS/remote wireless communication facilities. **Necessary provisions shall be provided to accommodate CT-PT units, EB bi-directional meters etc. Cubicle shall be IP 43**

Inspection and testing:

HT multipanel shall be despatched only after completing all the tests as per. No charges on account of tests conducted shall be payable to the supplier by the Client. Panel tests shall be conducted in presence of the representative of the Client or to the entire satisfaction of the Client. Any additional tests indicated by the clients' representative if any of the tests results he may think as unsatisfactory shall be done by the supplier without extra charges.

Warranty:

The equipment shall be warranted for replacement and repair for a minimum period of **25 months** from the date of supply or **24 months** from the date of commissioning whichever occurs earlier.

Transportation:

The site is located at Kottiyam/Kollam.

Transportation of the Substation from manufacturer's works up to site shall be arranged by Supplier. Supplier shall arrange man force to lift transformer to the location if required.

I. VACUUM CIRCUIT BREAKER PANEL INCOMER – 1 NO			
SL.NO	**ITEM**	**MAKE**	**QTY**
1	**Vacuum Circuit Breaker**		
a	11kV, 350MVA, 800A draw out type Vacuum Circuit Breaker with manual/motor operated spring charging mechanism, 230V AC motor,	Schneider,Siemens,ABB	1

	mechanical ON/OFF indicator, shunt trip and anti pumping device		
2	**Current Transformer**		
a	11kv Indoor Resin Cast C.T Ratio: */5/5A Core 1: 15VA Class-5P10 Core-2: 15VA ,Cl : 0.5	Intrans, Resitech/Equivalent	3
3	**Voltage Transformer**		
a	Potential Transformer -11KV/110V, 25VA, Cl : 0.5	Intrans, Resitech/Equivalent	1 set
4	**Protection Devices**		
a	Instantaneous IDMT relay with 2 O/C + 1 E/F relay	C&S/Equivalent	1
b	Master Trip Relay	C&S/Equivalent	1
5	**Metering & Indication Devices**		
a	Ammeter	L&T/ AE/Rishab/Meco, Kaycee/Salzer/Vaishnav	3
b	Voltmeter with selector switch	L&T/ AE/Rishab/Meco, Kaycee/Salzer/Vaishnav	1 set
c	Indicating Lamp for VCB ON, OFF, spring control, trip circuit healthy, DC ON	Schneider/Siemens/ABB	5
d	6 Window Annunciation Panel with alarm	Bharani/ Equivalent	1
e	Push button for trip circuit healthy	Teknic/ Equivalent	As required
f	Power Pack – 110 V DC (Optional)	Roni/ Equivalent	As required
6	**Busbar Connections**		
a	Aluminum Busbar	Jindal/Equivalent	-
7	**Panel Accessories**		
a	VCB Panel	Intrans,Resitech/Equivalent	1
b	Breaker Control Switch	Switron/Equivalent	1
c	Switch with plug point	Anchor/Equivalent	1
d	Strip heater	Girish Ego/Equivalent	1
e	Thermostat for space heater	Girish Ego/Equivalent	1
f	Cubicle Lamp with switch	Philips//Equivalent	1
g	Control Wiring	Reputed brand	As required
h	Seal off bushings	Reputed brand	3

II. VACUUM CIRCUIT BREAKER PANEL OUTGOING – 1 NOS (EB METERING REQUIRED)			
1	**Vacuum Circuit Breaker**		
a	11kV, 350MVA, 800A, 26.3 kA draw out type Vacuum Circuit Breaker with manual/motor	Schneider,Siemen	1

	operated spring charging mechanism, 230V AC motor, mechanical ON/OFF indicator, shunt trip and anti pumping device	s,ABB	
2	**Current Transformer**		
a	11kv Indoor Resin Cast C.T Ratio: */5/5A Core 1: 15VA Class-5P10 Core-2: 15VA ,Cl : 1.0	Intrans, Resitech/Equivalent	3
b	11kv Indoor Resin Cast C.T(EB metering CT) Ratio: */5A 10VA Class-0.2S	Intrans, Resitech/Equivalent	3
3	**Voltage Transformer**		
a	Potential Transformer - 11KV/110V, 25VA, Cl : 1	Intrans, Resitech/Equivalent	1
b	Potential Transformer -11KV/110V, 25VA, Cl : 0.2(EB metering PT)	Intrans, Resitech/Equivalent	1 set
4	**Protection Devices**		
a	Instantaneous IDMT relay with 2 O/C + 1 E/F relay	C&S	2
5	**Metering & Indication Devices**		
a	Ammeter	L&T/ AE/Rishab/Meco, Kaycee/Salzer/Vaishnav	3
b	Voltmeter with selector switch	L&T/ AE/Rishab/Meco, Kaycee/Salzer/Vaishnav	1 sets
c	Indicating Lamp for VCB ON, OFF, spring control, trip circuit healthy, DC ON	Schneider/Siemens/ABB	5
d	6 Window Annunciation Panel with alarm	Bharani/ Equivalent	1
e	Push button for trip circuit healthy	Teknic/ Equivalent	As required
f	Power Pack – 110 V DC (Optional)	Roni/ Equivalent	As required
6	**Busbar Connections:**		
a	Aluminum Busbar	Jindal/Equivalent	As required
7	**Panel Accessories**		
a	VCB Panel	Intrans,Resitech/Equivalent	1
b	Breaker Control Switch	Switron/Equivalent	1
c	Switch with plug point	Anchor/Equivalent	1
d	Strip heater	Girish Ego/Equivalent	1
e	Thermostat for space heater	Girish Ego/Equivalent	1

f	Cubicle Lamp with switch	Philips//Equivalent	1
g	Control Wiring	Reputed brand	As required
h	Seal off bushings	Reputed brand	3
i	Surge arrester	Dehn/Obo/Cape	

III. LOAD BREAK SWITCH PANEL OUTGOING – 3 NOS			
1	**Vacuum Circuit Breaker**		
a	11kV, 350MVA, 630A, 26.3 kA 11kV, 350MVA, 630A Load Break Switch Panel with earth switch , 3Nos. HT HRC fuses seal off bushings, Mechanical ON, OFF and TRIP Indication, -3 No's, 230V AC motor, mechanical ON/OFF indicator, shunt trip.	Intrans,Resitech/Equivalent	3

SECTION F

BILL OF QUANTITIES

Prices, Taxes and Duties

SL NO:	DESCRIPTION	QTY	BASIC PRICE	TAXES & DUTIES	TOTAL PRICE
1	Cost of HT multipanel **(IP 43)** with 1 no: incomer VCB and 3 no: outgoing LBS and 1 no: outgoing VCB	1			
2	Transportation	1			
3	AMC Charges for 5 years after Warranty	1			
	TOTAL COST:				

Prices quoted shall be for at site inclusive of all taxes, duties and statutory levies. Prices shall be firm and escalation of prices on no account is permissible. Prices quoted should indicate the percentage of taxes

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