

Tender for supply and erection & commissioning of 11 kV Volt 400 KVA Transformer and Distribution system at Central Pulp & Papers Research Institute, Paper Mill Road, Himmat Nagar, Saharanpur.

BOQ			
S.N.	Items	Unit	Qty.
1	Supply and erection of commissioning of 11 kV Volt 400 KVA distribution transformer level-2 with provision of on load tape changing as per norms of IS 1180.	No.	01
2	Supply and installation of 11KV 630 Amp. VCB as per attached specification	No.	01
3	Supply & Laying of Aluminium conductor insulated armoured served sheathed cable 1100 Volt grade at the depth 750mm below down label over a cushion of 75mm thick sand all around and protected with burnt bricks on surface the cable run shall be fixed on MS clamps etc of suitable size of as direction by the E.I. completing all respect the armouring of the cable shall be properly connected with the earth conductor.	Meter	70
4	Supply & laying of 3 core standard Aluminium conductor XLPE (Cross linked polyethylene) insulated PVC bedded Galvanized flat steel strip armoured cables confirming to IS 7098 (Part-2) with latest amendments 11 KV grade at a depth of 900 mm below done level over a cushion of 100 mm thick river sand all around and protected with bell burnt bricks on sides and on top put across. The armouring of cable shall be properly connected with earth conductor .HT XL PE Cable of size 70mm Sq. X 3.0 core.	Meter	70
5	Supply & making of 11 KV heat shrink cable out door 11 KV 70mm Sq. cable and termination with cable jointing kit.	No	02
6	Supply & making of 11 KV heat shrink cable indoor 11 KV 70mm Sq. cable and termination with cable jointing kit.	No	04
7	Supply and fixing of 11KV insulator for isolating the system.	No	01
8	Supply and bearing of water level earthing	No	15
9	Supply and laying 50mmX6 mm G.I. strip at 0.5m below brown at strip earth electrode, including connection/ termination with GI nut bolt, spring washer etc as required joining shall be done by overlapping and with 02(Two) sets of GI nut bolt and spring	meter	35

	washer spaced at 50mm.		
10	Supply & erection a set of single piece non-linear resistor type lightning arrester suitable for 3 wire 11 KV Transformer rated voltage 10 KV discharge current rating of 10 KA complete with galvanized clamping arrangement.	set	01
11	Supply & fixing brass nickle plated compression gland for PVC insulated and armoured served sheathed underground cable including rubber ring etc. complete in all respect the armouring of the cable shall be properly connecting with the earth as direction of E.I. 300 Sq. mm 3.5 core	No.	06
12	Supply & fixing brass nickle plated compression gland for PVC insulated and armoured served sheathed underground cable including rubber ring etc. complete in all respect the armouring of the cable shall be properly connecting with the earth as direction of E.I. 120 Sq. mm 3.5 core	No.	10
13	Supply & fixing brass nickle plated compression gland for PVC insulated and armoured served sheathed underground cable including rubber ring etc. complete in all respect the armouring of the cable shall be properly connecting with the earth as direction of E.I. 70 Sq.mm 3.5 core	No.	10
14	Supply & fixing of plain or pin type Aluminium socket (Thimble/Lug) to the cable leads, Insulated tape and making connection etc complete in all respect as per direction of E.I. 300 Sq.mm 3.5 core	No.	24
15	Supply & fixing of plain or pin type Aluminium socket (Thimble/Lug) to the cable leads, Insulated tape and making connection etc complete in all respect as per direction of E.I. 120 Sq.mm 3.5 core	No.	24
16	Supply & fixing of plain or pin type Aluminium socket (Thimble/Lug) to the cable leads, Insulated tape and making connection etc complete in all respect as per direction of E.I. 70Sq.mm 3.5 core	No.	24
17	Supply erection testing and commissioning of 440 Volt 1250 Amp incomer ACB panel with 02 Nos. of MCC (Distribution panel) as per attached drawing	No.	01
18	Construction of Transformer plinth or size 2.5X2.5X 1 mt. height	No.	01

	making with brick and RCC work		
19	Fencing of transformer with wireness fencing with providing of one no. gate.	No.	01

Buyback items

Sr. No.	Particulars	Make	Unit	Condition
1.	11 KV Volt 1000 KVA distribution transformer	Siemens Bharat Bijli	1	Working
2.	Old OCB	-	1	Non-working

Technical specifications

Scope of Work: -

The scope of work against tender comprises the following supply of 400 KVA, 11KV/433 V Distribution T/F and 630 Amp vacuum circuit breaker

1. For 400 KVA 11 KV/433 Volt Transformer

Specifications:

- a) Continuous rating ---400kVA
- b) No of Phases ---Three (3)
- c) Rated Frequency ---50 Hz
- d) Type of Cooling ---ONAN
- e) Normal Rating of Transformer HV/LV --- 11kV/0.433kV
- f) Primary Voltage @No Load ---11 kV
- g) Secondary Voltage @ No Load ---0.433 kV
- h) Method of Connection
 - HV winding ---Delta
 - LV winding ---Star
- i) Material Used for winding ---Copper
- j) Tap Range /Steps ---+5% to -10%@+2.5% per step
- k) Tap Changer ---OLTC
- l) Ambient Condition
 - Max& Min ---50°C & -5°C
 - Maximum Humidity ---70%

2.1 Tank Construction in all respect to clause 15 of IS 1180(Part-1):2014.

(a) The tank shall be rectangular shape with round edges or round shape and be fabricated from tested quality of mild steel of adequate thickness i.e. minimum 4mm for side walls and 5mm for top and bottom plates. The surface of the transformer body shall be Conventional tank with pressed steel radiator.

(b) To provide rigidity and to meet the pressure inside the tank due to short circuit current, the tank shall be suitably stiffened. The stiffeners wherever applicable are provided on all the four sides wall of the tanks, designed not to retain water.

(c) The tank cover shall be slightly slopping towards HV bushing and shall provide facilities for draining of water. The cover plate shall be bent to cover the tank packing.

(d) The transformer tank shall be complete with all accessories, lifting lugs and shall be designed to allow the complete transformer tank, filled with oil to be lifted by crane or other means without risk of any damage and transported by rail/road/sea without straining any joints and without causing leakage of oil.

(e) Bolted cover shall be provide on tank, top cover to inspect core, winding and have access to the bottom of bushing.

2.2 OIL:

a) The insulating oil shall comply with the requirements of IS 335. Use of recycled oil is not acceptable. The specific resistance of the oil shall not be less than 35×10^{12} ohm-cm at 27°C when tested as per IS 6103.

b) Oil shall be filtered and tested for break down voltage (BDV) and moisture content before filling.

c) The oil shall be filled under vacuum.

d) The design and all materials and processes used in the manufacture of the transformer, shall be such as to reduce to a minimum the risk of the development of acidity in the oil.

3. Fittings: The transformers shall be complete with the following fittings: -

a) Oil conservator with oil level indicator, minimum level marking and drain plug for all transformers of capacity 50kVA and above.

b) Off circuit type tap changer with position indicator and locking arrangement for all transformers.

c) Thermometer pocket with plug for all transformer of capacity above.

d) 100mm dial type/stem type thermometer with metal guard Dial type thermometer may have max. Temperature indicator and resetting device for all transformers of capacity 250kVA and above.

e) Lifting lugs for all transformers.

f) Bi-directional /Unidirectional rollers to be specified.

g) Rating diagram and terminal marking plate for all transformers

h) Explosion vent for all transformers of capacity 400kVA and above.

i) Additional Neutral separately brought out on a bushing for earthing for all transformers.

j) Earth terminals (2nos.) for body earthing for all transformers.

k) Valves for filtration, drainage and filling etc. with necessary plugs for all transformers.

l) Radiator assembly for all transformers.

m) Silica gel breather for all transformers.

n) Air release plug for all transformers.

o) First filling of oil to IS 335/1993 including make-up fill during installation for all transformers.

p) Bushing terminations or cable box terminations as specified.

q) Necessary hardware, clams, lugs etc. for termination on HV etc. for all transformers. Explosion Vent Explosion vent or pressure relief device shall be provided of sufficient size for rapid release of any pressure that may be generated within the tank and which might result in damage to the equipment. The device shall operate at a static pressure less than the hydraulic test pressure for transformer tank. Means shall be provided to prevent the ingress of moisture and of such a design to prevent gas accumulation.

4. Rating and Diagram plates

The following plates shall be fixed to transformer in a visible position.

a) A rating plate of weather proof material bearing the data specified in the appropriate clauses of IS: 2026/1977.

b) A diagram plate showing the internal connection and also the voltage vector relationship of the several windings in accordance with IS: 2026-1977 and a plan view of the transformer giving the correct physical relationship of the terminals.

5. Efficiency & regulation table must be provided.

a) No load voltage ratio measurement tolerance as per IS: 2026

b) All tap winding resistance measurement (H.V winding)

c) Turns ratio test

d) Winding Resistance test

e) No load loss tested from LV

f) Load Loss tested at temperature from HV side

g) Separate Source voltage withstand test

h) Induced over voltage withstand test.

i) Polarization Index

j) Vector group:

6. Type/Special Tests

a) Dielectric tests

i) Separate source voltage withstand test

ii) Induced over voltage withstand test

b) Breakdown voltage of oil

c) Magnetic balance test

d) Temperature rise test

e) Impulse test

f) Measurement of zero sequence impedance

g) Measurement of acoustic noise level

h) Measurement of harmonics of the no load current

i) Measurement of capacitance and Tan delta

j) Test on marshalling Box

k) CT ratio measurement

7. Acceptable deviation Clause

a) Bushing shall be oil filled porcelain condenser: Bushing considered shall be oil communicating type porcelain bushing for HV & LV

b) Rating of bushing shall be suitable to withstand system short circuit level and 1.2 times of the rated current.

c) Transformer shall have the provision for installation of 'Fire prevention & extinguishing system'

d) Insulating oil shall conform to the requirement of IS 335(Class 1, new mineral insulating oil): Insulating oil shall be as per IS:335 only (un-inhibited)

e) Bushing, Cable terminal boxes & terminals.

f) PU based paint shall be used for exterior: PU paint as per IS 631 with epoxy High Build MIO as an intermediate layer.

g) Conservator oil preservation system shall be by using air cell placed inside the conservator: Air cell are required in the conservator as per specification.

h) Bimetallic terminal connectors suitable for the termination as specified in the datasheet shall be provided: Bimetallic washers are required at HV palm to facilitate connection of aluminium lug. Hot dip galvanized nut-bolts also to be provided for lugs termination. Bimetallic terminals connectors are not required.

- i) All bolted connection shall be fitted with weather proof hot oil resistant gasket in between for complete oil tightness. Neoprene gasket shall be used: Gasket shall be as NBR gasket for cable & marshalling box while SRBC gasket at oil interacting surfaces.

8.a Transformer will be supplied standard given below: -

Indian Standard	Title	International standard
IS:2026:1977-81	Specification for Distribution Transformer	IEC-76
IS:1180	Outdoor distribution transformers up to and including 100KVA	
IS:335/1993	Insulation oil for transformer & switch gear	BS-148
IS:3639:1968	Fitting and accessories for Distribution transformer	ASTM D-1275
IS:-2099:1986	High Voltage porcelain brushings	IEC 296-1969
IS:7421-1988	Low voltage porcelain bushings	-
IS:3347	Dimensions for outdoor bushings	DIN 42531 to 33
IS:5/1961	Specification for colours for ready mixed paints	-
IS:6600/	1972 Guide for loading oil immersed transformer	-

- 8.b Installation of Transformer as per Electricity department of U.P. (Safety Department)
- 8.c All the earthing as per standard of safety department.
- 8.d Testing of Transformer before charging in the scope of contactor
- 8.e Testing result will be provided by the contactor before charging of T/F to CPPRI
- 8.f Filtration of Transformer oil at our site in the scope of contactor before charging of transformer.
9. **For 630 Amp vacuum circuit Breaker**
- 9.a VCB must be supplied as per norms of Indian Electricity Authority Department.
- 9.b Installation of VCB will be as per Electricity Safety Department.
- 9.c All the earthing will be as per standard norms of safety.
- 9.d Testing of VCB in the scope of contactor.
- 9.e Testing of relay in the scope the contactor.
- 9.f Auxiliary supply will be 24 Volt DC / power pack/ Battery Bank.
- 9.g In vacuum circuit breaker the protection relay as under: -
- (i) Over current relay
 - (ii) Earth fault relay
 - (iii) Auxiliary relay for OTI / WTI,
 - (iv) Master trip
 - (v) Ampere meter, Volt meter, KWh meter
- 9.h Testing will be provided for VCB at our campus CPPRI will be in the scope of contactor
- 9.i CT ratio for VCB is 50-25/5-5
- 9.j PT will be 11 KV/110 Volt
- 9.k VCB panel will be with enclosure of incoming and outgoing supply.
- 9.l Bus bar of VCB in the scope of contactor
- 10 Special condition of work
- 10.a All the material, T & P testing kit will be arranged by contactor at his own cost.
- 10.b Skilled/ Unskilled labour will be arranged by the contactor at his own cost.
- 10.c Electricity supply shall be provided by the CPPRI to the contactor free of cost.
11. The contractor shall prepare and produce instruction, operation and maintenance manuals in English for the use, operation and the maintenance of

- the supplied equipment and installations, and submit to the Engineering Head in TWO copies (i.e. for each equipment) at the time of handing over. The Detail manual shall generally consist of the following:
- a) Description of the project
 - b) Operating instructions
 - c) Maintenance instructions including procedures for preventive maintenance
 - d) Type and routine test certificates.
 - i) Test certificate of VCB panel & its accessory separately.

Technical specifications

The scope of work against tender comprises the following supply of 400 KVA, Power connection and Distribution system at CPPRI Campus Saharanpur.

1. Cable
Cable will be supplied as per standard make XLPE type
2. Cable jointing Kit
Cable jointing kit will be as per standard make like Rechem etc heat shrink type
3. Laying of Cable /Termination
The laying of HT/LT cable as per the standard of safety department norms
4. Earthing
Electrode earthing will be provided by the contactor as per standard and as per standard level of earthing suitable for 11 kV /0.433kV
5. Cable lugs
All the cable lugs will be crimped by the crimping tool, will be arrange by the contactor
6. LT Pannel
The supply of ACB will be standard make and other switches etc also in of same standard.
7. Paint
Paint of panel will be fine quality preferred power coating
8. Inspection of material
Before supply of material contactor arrange to inspect the material by CPPRI staff if require. Before supply of material contactor informed CPPRI in one week.

Projection

15'

Projection

Projection

Projection

CABLE TRENCH

ROOM
15'-0"X12'-0"

IN COMER

OUT
GOING

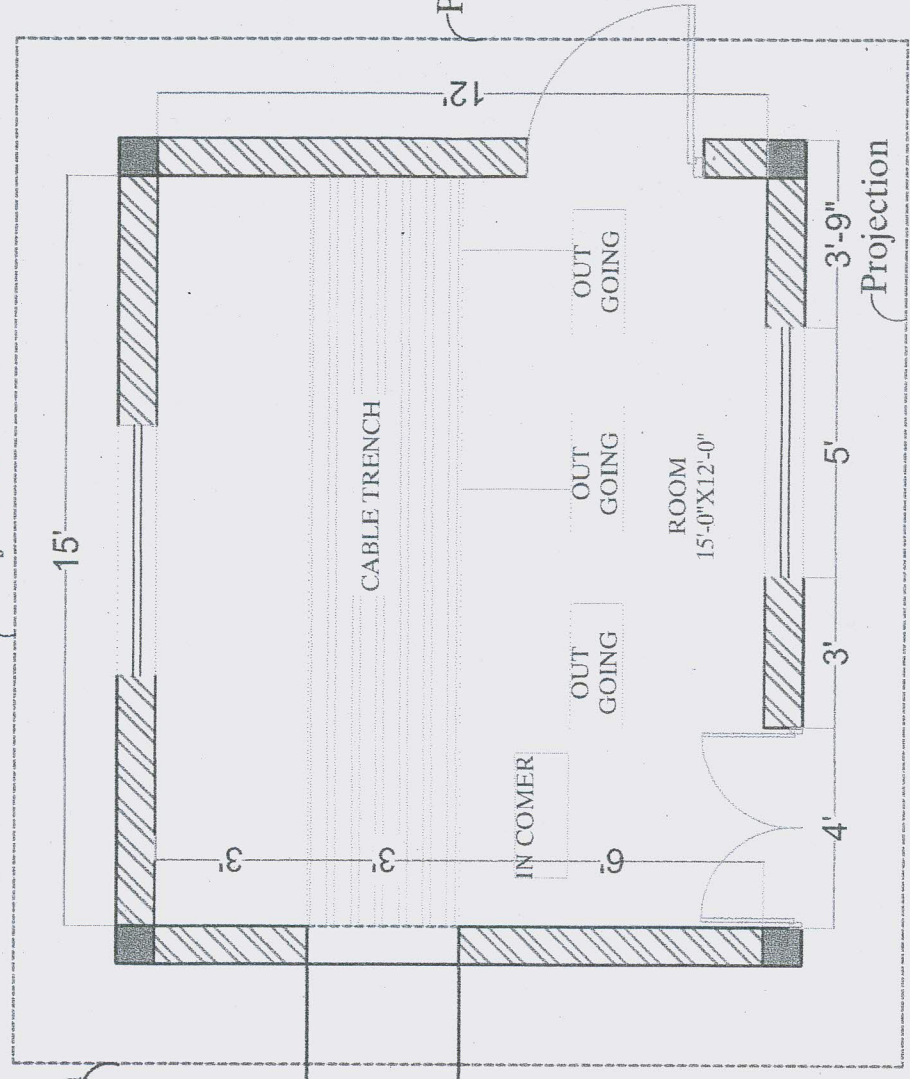
OUT
GOING

OUT
GOING

TRANS FARMER
PLINTH

TRANS FARMER

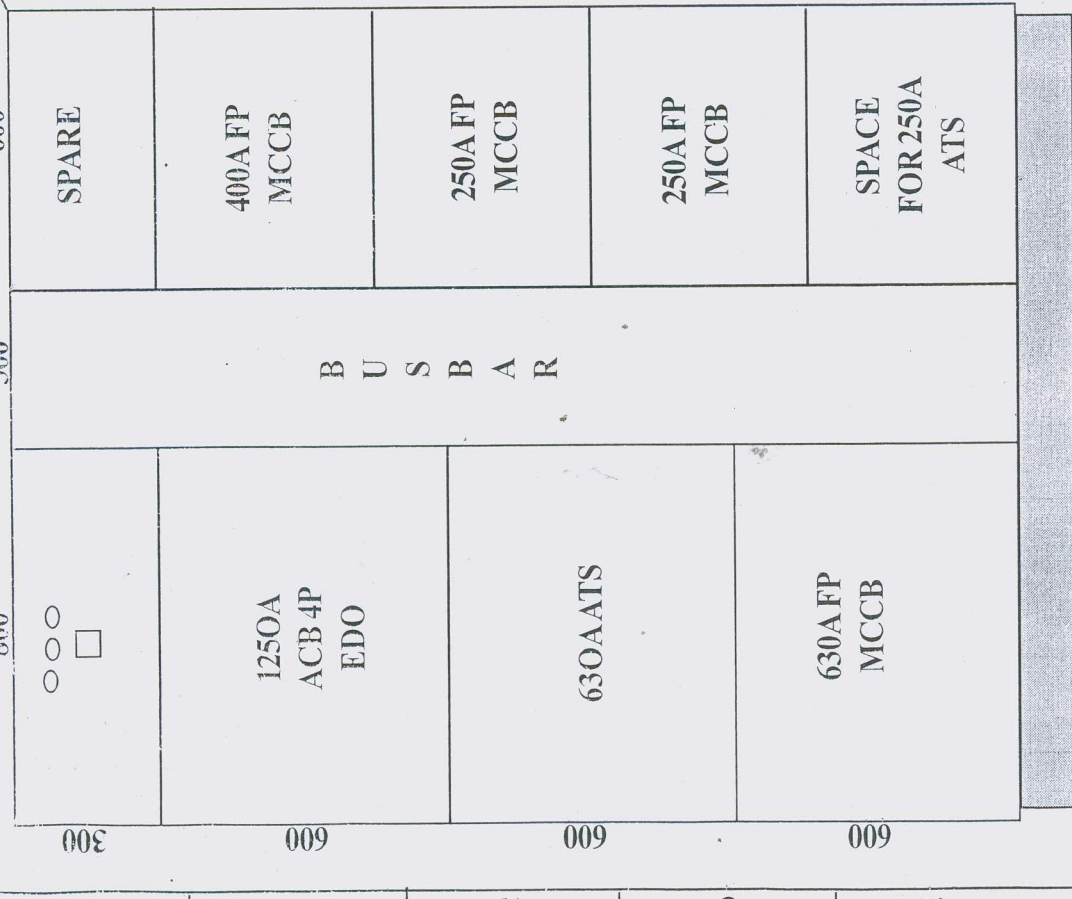
TO METER
ROOM



PROPOSED LT ROOM FOR CPPRI CAMPUS SHARAN PUR UP 247001

1000

01 02 03 04 05 06 07 08 09



NOTES:-

1. PANEL SHALL BE INDOOR TYPE.
2. PANEL SHALL BE MADE OUT OF 2MM THICK SHEET
3. PANEL SHALL BE POWDER COATED WITH SIEMENS GREY SHED.
4. ANGLE FRAME SHALL BE OF 75X40X6MM
5. MAIN BUS BAR SHALL BE 1500A ALUMINIUM (150X10 MM) FOR RYB & N
6. EARTH BUS ACROSS THE PANEL SHALL BE 25X6 MMALUMINIUM.
7. CABLE ENTRY SHALL BE FROM REAR SIDE OF PANEL.
8. LIFTING HOOKS SHALL BE PROVIDED.
9. COLOUR COADED HEAT SHRINKABLE SLEEVES SHALL BE USED.
10. CONTROL WIRING SHALL BE DONE WITH 1 SQMM COPPER FLEXIBLE WIRE.
11. INDICATING LAMPS SHALL BE L E D TYPE.

for Khushi Engineer
Archaarya
 PRODIGE

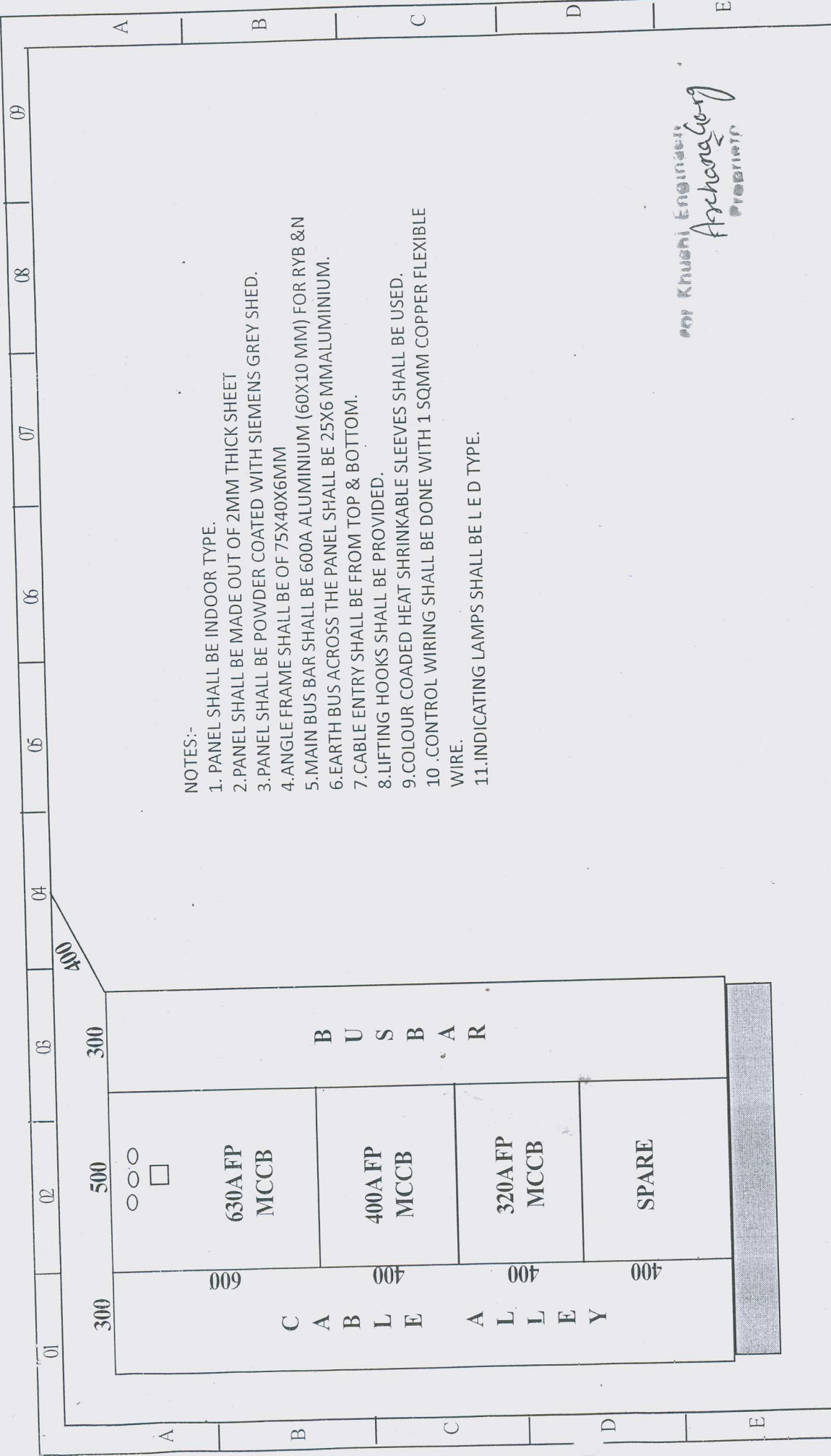
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	<p>Manufacturer: S.S. ENTERPRISES</p>	<p>DATED</p>
	<p>A-2/3 INDUSTRIAL ESTATE, MEERUT ROAD MUZAFFARNAGAR, Mo. 9412210020 email: ssenderprisesmzn@hotmail.com</p>	<p>SHEET & FILE No.</p>
	<p>AN (SO 9001 : 2008 COMPANY</p>	<p>ALL DIMENSIONS IN mm</p>

CLIENT :-

PROJECT :-

DETAIL :-

DONOTSCALE

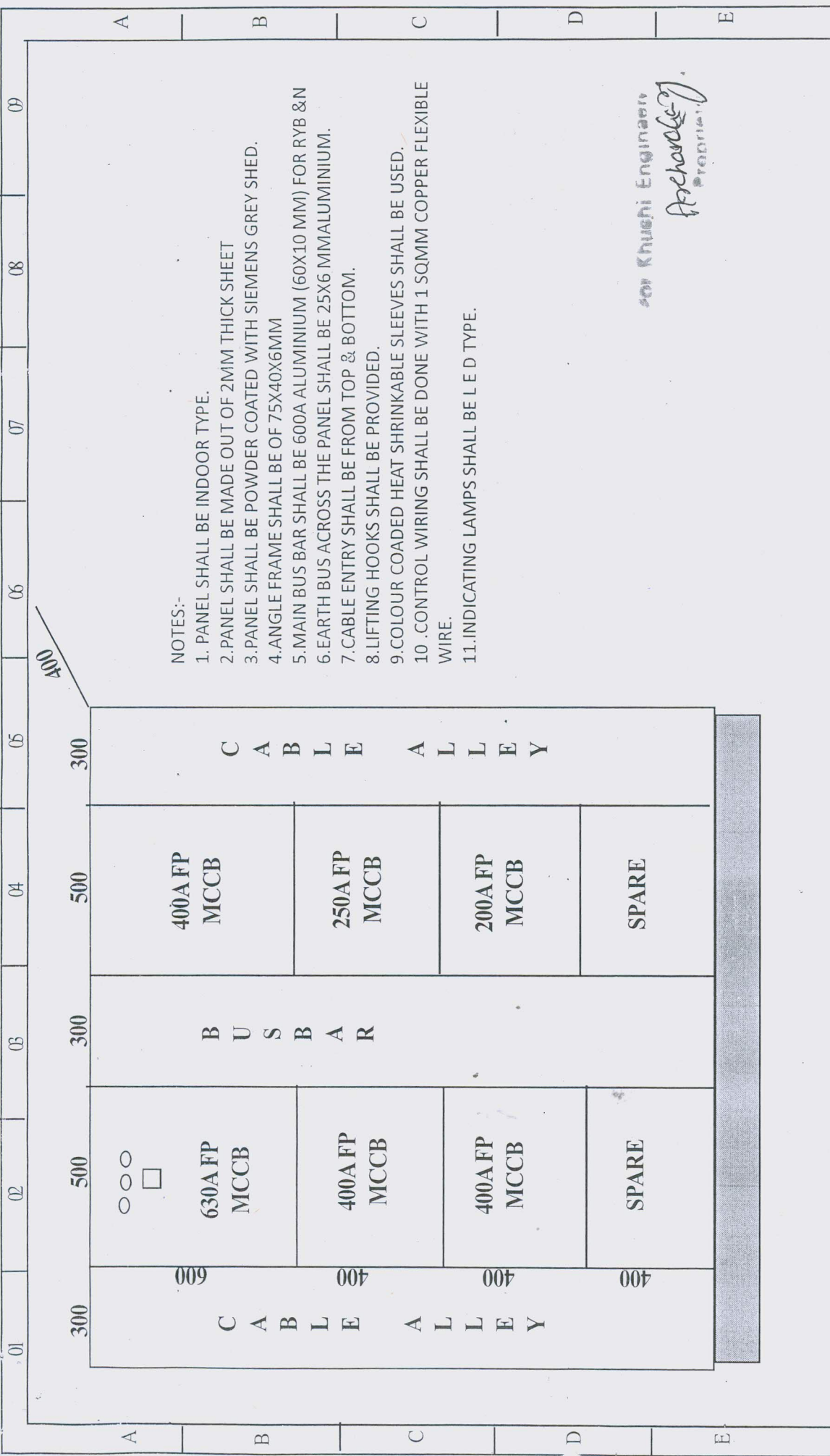


- NOTES:-
1. PANEL SHALL BE INDOOR TYPE.
 2. PANEL SHALL BE MADE OUT OF 2MM THICK SHEET
 3. PANEL SHALL BE POWDER COATED WITH SIEMENS GREY SHED.
 4. ANGLE FRAME SHALL BE OF 75X40X6MM
 5. MAIN BUS BAR SHALL BE 600A ALUMINIUM (60X10 MM) FOR RYB & N
 6. EARTH BUS ACROSS THE PANEL SHALL BE 25X6 MM ALUMINIUM.
 7. CABLE ENTRY SHALL BE FROM TOP & BOTTOM.
 8. LIFTING HOOKS SHALL BE PROVIDED.
 9. COLOUR COADED HEAT SHRINKABLE SLEEVES SHALL BE USED.
 10. CONTROL WIRING SHALL BE DONE WITH 1 SQMM COPPER FLEXIBLE WIRE.
 11. INDICATING LAMPS SHALL BE LED TYPE.

for Khushi Engineers
Archana Garg
 PRADEEP

	Manufacturer: S.S. ENTERPRISES	PANEL NO.2
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CLIENT :- PROJECT :- DETAIL :-	ALL DIMENSIONS IN mm DONOTSCALE	

AN ISO 9001 : 2008 COMPANY



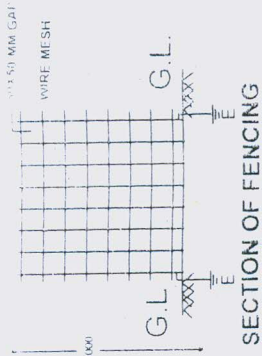
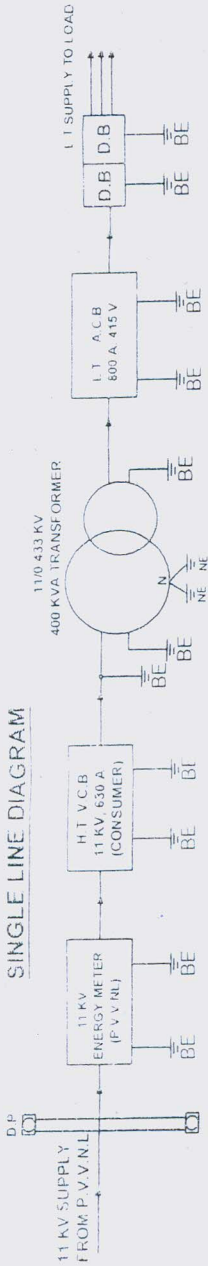
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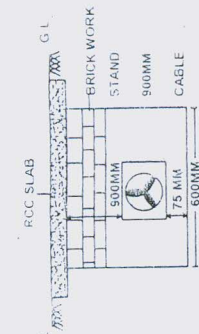
for **Khushti Engineering**
Architects
 PUNE

CLIENT :-	TITLE :-	MANUFACTURER:	
PROJECT :-	PANEL NO.3	S.S. ENTERPRISES	
DETAIL :-	DATED	A-2/3 INDUSTRIAL ESTATE, MEERUT ROAD MUZAFFARNAGAR, Mo. 9412210020 email: senterprisesmzn@hotmail.com	
	SHEET & FILE No.		

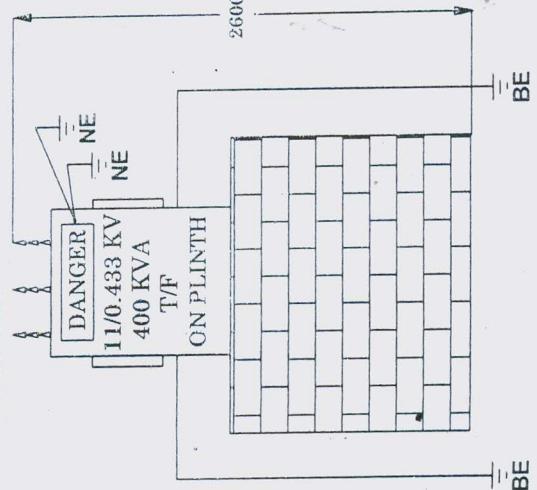
SINGLE LINE DIAGRAM



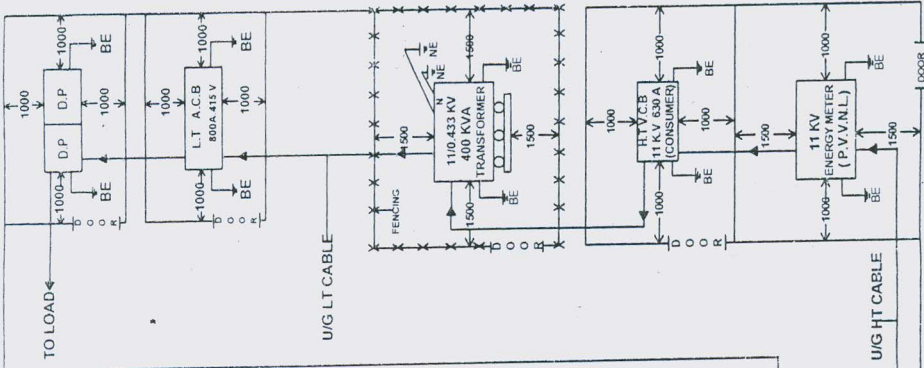
SECTION OF CABLE TRENCH



SECTION OF PLINTH



WORKING AREA



**LAYOUT PLAN OF 11/0.433K.V
TRANSFORMER SUBSTATION OF 400 K.V.A
M/S CENTRAL PULP & PAPER RESEARCH
INSTITUTE
SAHARANPUR**

NOTES:

- (1) PLINTH LEVEL OF TRANSFORMER AND SUB-STATION SHALL BE KEPT HIGHER THAN THE HIGHEST FLOOD AND STORM WATER LEVEL OF THE AREA.
- (2) THE EARTHING SHALL BE DONE AS PER IS 3043-1966.
- (3) ALL EARTHING CONNECTION WILL BE WITH MAIN EARTHING LEAD OF EARTHMENT.
- (4) ALL DIMENSIONS ARE IN M.M.
- (5) ALL DOORS AND WINDOWS ARE METALLIC AND OPEN OUT SIDE. SIZE 2100X1200 M.M.
- (6) LT CABLE LENGTH BETWEEN TRANSFORMER TO LT. PANAL IS LESS THEN 20 METERS.
- (7) SUPPLIERS METER AND EQUIPMENTS SHALL BE INSTALLED AS PER PROVISIONS MADE IN ELECTRICITY SUPPLY CODE-2005 AND AS PER PROVISION OF RULE 64(1)(B) OF I.E.RULES, 1956.
- (8) SIZE OF EARTH STRIP IS 50X6 MM GI.
- (9) SIZE OF EARTH PLATE IS 900X900X6.35 MM GI.
- (10) SIZE OF LT CABLES IS 3% CORE X 300 MM SQ. AL. x 2 NOS.
- (11) SIZE OF HT CABLES IS 3 CORE X 70MM SQ XLPE.
- (12) DRAWING IS NOT TO BE SCALE.
- (13) INDEPENDENT ENTRY IN METERING CUBICAL ROOM SHALL BE PROVIDED IN SUCH A WAY THAT METER ARE ALWAYS ACCESSIBLE FOR INSPECTION OF P.V.V.N.L WITHOUT INFRINGING THE PRIVACY OF THE CONSUMER.
- (14) CLEARANCE BETWEEN LIVE PART 11 KV SIDE T/F BUSHING AND GROUND IS NOT LESS THAN 2600 MM.

DETAILS OF TRANSFORMER

MAKE - TO BE GIVEN ON H.V. STATEMENT FORM
 SL. NO. - TO BE GIVEN ON H.V. STATEMENT FORM
 CAPACITY - 400 K.V.A
 VOLTAGE - H.V. 11000 V. L.V. 433 V.
 CURRENT - H.V. 20.99 A. L.V. 533.35 A.

SIGNATURE OF AUTHORITY

P.V.V.N.L WITH FUSE SET
& ISOLATER & CT,PT

ROAD

MAIN GATE

By Krishna Engineer
 Acharya
 Puri