

Nepal Electricity Authority

(A Government of Nepal Undertaking)

Transmission Directorate

Grid Development Department

Burtibang Paudi-Amarai Tamghas Sandhikharka Gorushinge 132kv Transmission Line
Project



Bidding Document

For

“Design, Supply, Construction, Testing And Commissioning of Motipur
and Sandikharka 132/33/11 kV, Substation”

International Competitive Bidding (ICB)
(Single Stage, Two Envelope Bidding Procedure)

IFB No: BPTSG-074/75-02

Employer: Nepal Electricity Authority

Burtibang Paudi-Amarai Tamghas Sandhikharka Gorushinge 132kv Transmission Line
Project

VOLUME II-B OF III

Date: November 2017



BIDDING DOCUMENT

TECHNICAL BID

**PROCUREMENT OF WORKS
International Competitive Bidding (ICB)
Single Stage two Envelope Bidding**

**“Design, Supply, Construction, Testing And Commissioning of Motipur
and Sandikharka 132/33/11 kV, Substation.”**

Issued on:

Bid Document issued to:

Contract Identification No: BPTSG-074/75-02

Project Name : *Burtibang Paudi-Amarai Tamghas Sandhikharka Gorushinge 132kV
Transmission Line Project*

Office Name : *Nepal Electricity Authority*

Office Address: *Kharipati, Bhaktapur, Nepal*

Financing Agency: Government of Nepal (GoN), Nepal



Yanay

Chapter 21: Technical Data Sheet (Guaranteed Technical Particulars)

(Bidder's Name)

TECHNICAL DATASHEETS (Guarenteed Technical Particulars)

S.NO.	CONTENTS
1.0	Air Conditioning
2.0	Batteries and battery chargers
3.0	Bay Control unit
4.0	Circuit breakers
5.0	Control and relay panels
6.0	Current transformers
7.0	Capacitor voltage transformers
8.0	Isolators/Grounding switches
9.0	Lighting system
10.0	Power Transformer
11.0	LT Switchgear
12.0	600 V power and control cables
13.0	11 kV and 132 kV XLPE Cable
14.0	Substation Automation System
15.0	Surge Arresters
16.0	Insulator.Hardwares & Accessories
17.0	L.T. Transformer
18.0	Communication Equipments



Handwritten signature

(Bidder's Name)

1.0	AIR CONDITIONING	
Sl.No	Description	Offered Data
1	Manufacturer's Name & Model	
2	Star Rating	
3	Compressor Cooling capacity	
4	Rated current -cooling	
5	Rated Power input- cooling	
6	Rated EER	
7	Power Supply	
8	Air Flow Volume- Indoor	
9	Noise level - Indoor	
10	Operation	
11	Compressor type a)Compressor make b)Compressor sealed	
12	Refrigerant	
13	Indoor unit Dimension (WxHxD)	
14	Indoor unit Net/Gross weight	
15	Outdoor unit Dimension (WxHxD)	
16	Outdoor unit Net/Gross weight	
17	Connecting Pipe with Cable	
18	Length	
19	Connecting Box Dimension (WxHxD)	
20	No of Boxes	
	a)ODU	
	b)Connecting pipe	
	c)IDU	
21	Features	
	a)Filters	
	b)Coil	
	c)Copper tubes	
	d)IDU	
	e)Remote	



Handwritten signature

(Bidder's Name)

2.0 BATTERIES & BATTERY CHARGERS

Sl.No	Description	Offered Data	
		110V	48V
A.	BATTERIES		
1.0	Manufacturer's Name & address		
2.0	Confirm whether Manufactures have Manufactured, tested, supplied, installed and commissioned batteries of 220V, 600AH, capacity similar to the offered batteries and are in operation for at least 2(Two) years		
3.0	Type of battery		
4.0	Capacity of battery at 27 C		
5.0	Whether batteries are type tested as per IEC		
6.0	Recommended value of float charging voltage		
B.	BATTERY CHARGERS		
1.0	Manufacturer's Name & address		
2.0	Confirm whether Manufactures have Manufactured, tested, supplied, installed and commissioned battery chargers of 10 KW capacity similar to the offered battery charger		
3.0	Capacity of battery charger (AH)		
4.0	Charger rate/output current		
5.0	Float charging mode (A)		
6.0	Boost charging mode (A)		
7.0	Ripple content in output voltage %		
8.0	Confirm whether battery chargers are type tested as per specification		



Handwritten signature

(Bidder's Name)

3.0 BAY CONTROL UNIT

Sl.No	Description	Offered Data
1.0	Name of Manufacturer	
2.0	Type of unit Mounting	
3.0	Manufacturer's type designation	
4.0	Standards Applicable	
5.0	Rated Auxiliary Voltage	
6.0	No. of analogue variable (Specify Voltage & Current Separately)	
7.0	Rated frequency (Hz)	
8.0	No. of binary inputs	
9.0	No. of output	
10.0	Language	
11.0	Type of communication protocol supported by unit	
12.0	No. & Type of communication ports	
13.0	Operating temperature range	
14.0	System response time	
14.1	Exchange of display	
14.2	Presentation of Binary Change	
14.3	Presentation of Analogue Change	
14.4	Order to process output	
14.5	Order to update display	
14.6	Report Generation	



Handwritten signature

(Bidder's Name)

4.0 CIRCUIT BREAKERS

S.No	Description	Offered Data		
		145KV	36KV	12KV
1	Name of the Manufacturer			
2	a)Type of Circuit Breaker			
	b)Type of tank (Live / Dead)			
3	Manufacturer's type designation			
4	Standards Applicable			
5	Rated Voltage (kVrms)			
6	Rated continuous current at design temperature of 50 deg.C (Amps)			
7	Rated frequency (Hz)			
8	Number of poles			
9	Whether 3 pole or single pole unit			
10	No. of breaks per pole			
11	Rated short circuit breaking current			
	i) Symmetrical component at highest system voltage (kAp)			
	ii) DC Component (%)			
	iii) Asymmetrical breaking current at highest system voltage (kA)			
12	Rated Making Capacity			
	i)at higher rated voltage (kAp)			
	ii)at lower rated voltage (kAp)			
13	i). Maximum total break time under any duty condition for any current upto rated breaking current with limiting conditions of voltage and pressure (ms)			
	ii)Rated break time as per IEC condition (ms)			
	iii)Closing time (ms)			
	iv)Maximum opening time under any condition with limiting voltage and pressures (ms)			
	v)Maximum close open time under any(ms)			
14	First pole to clear factor			
15	Short time current rating for 1 second (kA)			
16	Rated operating duty			



Handwritten signature

S.No	Description	Offered Data		
		145KV	36KV	12KV
17	Maximum line charging breaking current with temporary over voltage upto 1.4 p.u (kA)			
18	.i) Maximum period between closing of first contact & last contact in a pole (ms)			
	ii) Maximum pole discrepancy (ms)			
19	Pre-insertion resistor			
	i)Value/pole (Ohms)/ with tolerance (ohms)			
	ii)Minimum and maximum duration of			
20	Small fault current breaking capacity (Amps)			
21	Maximum temperature rise for main contacts over design ambient temperature of 50 C (Deg. C)			
22	Rated pressure and limits of pressure of operating Mechanism (kg/sq.cm)			
23	Rated pressure and limits of pressure of extinguishing medium (kg/sq.cm)			
24	Minimum dead time for			
	i) Three phase reclosing (ms)			
	ii) Single phase reclosing (ms)			
25	Dielectric Withstand Voltage of Complete Breaker			
	i) One minute dry & wet power frequency withstand voltage			
	a)Between live terminal and ground (kV rms)			
	b)Between terminals with breaker contacts Open (kVrms)			
	ii) 1 2/50 micro second impulse withstand test voltage.			
	a)Between live terminals and ground (kVp)			
	b) Between terminals with breaker contacts Open (kVp)			
	iii) 250/2500 micro second switching surge withstand test voltage			
	a)Between live terminals and ground (kVp)			
	b)Between terminals with breaker contacts Open (kVp)			
	iv)Corona extinction voltage`			



Handwritten signature

S.No	Description	Offered Data		
		145KV	36KV	12KV
	v)Maximum radio interference voltage at 1.1 Ur/root 3			
	vi)Total creepage distance			
	a) To ground			
	b) Between terminals			
26	Operating Mechanism			
	a) Type of operating mechanism for			
	i) Closing			
	ii) Opening			
27	SF6 Circuit Breakers			
	a)Quantity of SF6 per pole at rated pressure (cu.m)			
	b)Guaranteed maximum leakage rate per year (kg/sq.cm)			
	c)Rated pressure of SF6 in operating chamber (kg/sq.cm)			
	d)Limits of pressure at which breaker operates correctly (kg/sq.cm)			
	e)Minimum time interval between each Make/break operation (ms)			
28	General			
	a)Weight of complete 3 phase breaker for foundation design (kg)			
	b)Impact loading Foundation design			
	c)Seismic level for which Breaker is designed (g)			
	d)Min. safety clearance from earthed objects			
	e)Noise level in Base of the breaker (dB) and upto 50m distance from base			
	Minimum clearance In air			
	i)between live parts (mm)			
	ii)live parts to earth (mm)			
	iii)live parts to ground level (mm)			
	g) Compliance to technical specification w.r.t parameters specified for			
	i)Control Cabinet			



Handwritten signature/initials.

S.No	Description	Offered Data		
		145KV	36KV	12KV
	ii) Bushing/support Insulator			
	iii) Terminal connector.			
	iv) SF6 Gas			
29	Detailed Literature			
	a) Whether similar equipment are type tested as per IEC and are in successful operation for at least 2 (two) years (If yes, furnish type test reports)			
	b) Furnish data on capabilities of circuit breaker in terms of time and number of operations at duties ranging from 100 % fault currents to load currents of the lowest possible value without requiring any maintenance or checks			
	c) Furnish details of effect of non simultaneity between contacts within a pole or between poles and also show how it is covered in the guaranteed rated break time.			
	d) Overall General Arrangement drawing of circuit breaker is to be enclosed.			



Handwritten signature

(Bidder's Name)

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
1	Name and address of Manufacturer of panels	
2	Manufacturer's type and designation	
3	Type of construction (Simplex/duplex)	
4	Thickness of sheet steel	
	(i)Front	
	(ii)Back	
	(iii)Sides	
5	Degree of protection	
6	Name of the manufacturer of relays	
7	DC voltage of the relays	
8	Make and Model of static (0.2 accuracy class type) energy meters	
9	Confirm whether offered manufacturer of C&Rpanels and protective relays have tested commissioned & they are in successful operationfor at least five years in 132 kV system	
I	TRANSMISSION LINE PROTECTION	
A	Numerical Distance protection Scheme	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Switched or Non- switched type (is it with separate measurements for single/three phase faults)	
4	Setting range of offset feature	
5	Whether the relay is having self monitoring feature	
6	Whether relay is compatible for Optical Fiber equipment and can be used for Permissive Under reach/over reach /Blocking scheme etc	
7	Suitable for single and three phase Trip?	
8	Type of shaped characteristic	
9	No of tripping contacts with making capacity of 30 amp for 0.2 seconds	



Handwritten signature

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
10	In case 16 contacts as per above clause are not available with the distance relay offered , type of tripping relay being offered	
11	Maximum operating time for at 50% of the reach setting of 2 ohms and 10/20 ohms (with CVT) including all trip relays ,if any	
	a)at SIR=4	
	b)at SIR=15, (3 phase faults)	
	c)at SIR=15 (other faults)	
12	IDMT earth fault relay Meeting Normal Inverse Characteristics as per IEC 60253 is being offered as built in feature for 220 KV lines	
13	If no, type of IDMT relay being offered	
14	Built in features offered with the relay (YES/NO)	
	a)Disturbance recorder	
	b)Fault locator	
	c)Over voltage (one stage only)	
	d)Auto reclose along with Dead line charging and check synchronisng	
B	BACKUP DIRECTIONAL OVER CURRENT AND EARTH FAULT PROTECTION SCHEME	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Three over current and one E/F elements Are whether independent or composite unit	
4	Type of relay (Elecromechanical /static/Numerical)	
5	Directional sensitivity	
6	Whether characteristic conform to IEC 255-3	
7	Over current unit setting range inverse time	
8	Earth fault unit setting range inverse time	
9	VT Fuse failure relay/ feature included for alarm	
C	LINE OVER VOLTAGE PROTECTION RELAY	
1	Name and address of Manufacturer	



Handwritten signature/initials

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
2	Manufacturer's type and designation	
3	Type of relay (Elecromechanical /static/Numerical)	
4	Operation indicator provided?	
5	Operating time	
6	Resetting time	
7	Whether monitors all three phases?	
8	Built in feature of Main1/Main 2 distance relay is offered. If so , which stage is offered as built in	
D	DISTANCE TO FAULT LOCATOR	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Built in feature of Main1/Main 2 distance relay is offered	
4	Maximum registering time	
5	Whether direct display unit provided?	
6	Whether both phase to phase fault and phase to earth fault measuring units included?	
7	Whether "On-Line" type	
8	Accuracy for the typical conditions defined under technical specification	
F	DISTURBANCE RECORDER	
	a. Acquisition unit	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	No. of analogue channels	
4	No. of digital recording channels	
7	Built in feature of Main1/Main 2 distance relay is offered	
6	Pre-fault memory (milli seconds)	
7	Post fault memory(seconds)	



Handwritten signature

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
8	Total storage memory in seconds	
9	Sampling frequency	
10	Resolution of event channels	
11	Time display present?	
12	Data output in comtrade is available?	
b. Evaluation Unit		
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	No of acquisition unit that can be connected to One evaluation unit	
4	Technical Parameters of evaluation unit	
	A Processor and speed	
	B RAM and hard disk capacity	
	C Additional facilities	
	D Details of printer	
5	Details of power supply arrangement for Acquisition unit (including printer)	
G	AUTO RECLOSE RELAY	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Electromechanical /static/numerical	
4	Auto reclose relay along with Dead line charging and check synchronizing relay (For 132 KV lines) offered as a part of distance relay	
5	Suitable for single and three phase?	
6	Single phase dead time setting Range	
7	Three phase dead time setting range	
8	Reclaim time setting range	
II	<u>TRANSFORMER PROTECTION</u>	



Handwritten signature

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
A	Differential relay	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Second harmonic restraint provided	
4	Whether three instantaneous units provided	
5	Operating Current setting range	
6	Bias setting range	
7	Operating time at 5X setting current	
8	Resetting time	
9	How ratio / phase angle corrections are being done (inter posing transformer/internal feature in the relay)	
B	Restricted Earth Fault Protection	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Operating time at 2 X setting	
C	Over Fluxing relays	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Whether inverse time operating characteristics	
4	Maximum operating time	
5	Accuracy of operating time	
6	Resetting time	
D	Directional O/C and E/F relays	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	



Handwritten signature

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
3	Whether Characteristic will confirm to IEC255-3	
4	Directional sensitivity	
5	Over current unit setting range	
	a) Inverse time	
	b) High set	
6	Earth fault unit setting range	
	a) Inverse time	
	b) High set	
GENERAL PROTECTION /MONITORING EQUIPMENT		
Trip Circuit Supervision relay		
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Whether pre-closing and post closing supervision provided?	
4	Time delay	
High Speed Trip Relays		
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Contact ratings	
	a) Make and carry continuously	
	b) Make and carry for 0.5 sec.	
	c) Break	
	i). Resistive load	
	ii) Inductive load (With L/R=40milli sec.)	
4	Operating time at rated voltage(maximum)	
5	Resetting time	
6	Whether supervisory relays included	



Handwritten signature/initials

5.0 CONTROL AND RELAY PANELS		
Sl.No	Description	Offered Data
E	Local breaker back-up protection	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Operating time	
4	Resetting time	
5	Setting ranges	
	a) Current	
	b) Time	
III	Bus bar Protection	
1	Name and address of Manufacturer	
2	Manufacturer's type and designation	
3	Type of relay (Elecromechanical /static/Numerical)	
4	Principle of operation (Biased/High impedance)	
5	Operating time	
6	Resetting time	
7	Setting ranges	
	i)Current	
	ii)Time	
8	Whether will it cause tripping for the differential current below the load current of heavily loaded feeder (Bidder shall submit application check for the same)	



Handwritten signature

(Bidder's Name)

6.0 CURRENT TRANSFORMER

S.No	Description	Offered Data		
		132KV	33KV	11KV
1.0	Name of Manufacturer			
2.0	Manufacturer's type designation			
3.0	Standards Applicable			
4.0	Type of CT (Live or dead Tank)			
5.0	Rated Voltage			
6.0	Rated frequency (Hz)			
7.0	Rated Current			
	a)Rated Continuous current			
	b)Rated extended primary current			
8.0	Short time thermal current withstand for 1 sec			
9.0	Dynamic current withstand			
10.0	1.2/50micro sec impulse withstand voltage			
11.0	250/2500micro sec switching surge withstand voltage			
12.0	One minute dry and wet power frequency withstand voltage			
13.0	No. of primary winding			
14.0	No. of cores per CT			
15.0	Current ratio for all cores			
16.0	Output burden for all cores			
17.0	Accuracy class for all cores			
18.0	Knee point voltage of at different taps for all cores			
19.0	Corona Extinction			
20.0	Partial discharge level			
21.0	Total weight			
22.0	Max exciting current at Knee point voltage at different ratio.			
23.0	Secondary winding resistance at all different ratio			



Handwritten signature/initials in blue ink.

(Bidder's Name)

7.0 CAPACITOR VOLTAGE TRANSFORMERS & VOLTAGE TRANSFORMERS				
S.No	Description	Offered Data		
		132KV CVT	33KV PT	11KV PT
1.	Name and address of Manufacturer			
2.	Manufacturer's type designation			
3.	Standards applicable			
4.	Rated primary voltage U_r (kV)			
5.	Rated secondary voltages (kV)			
6.	Number of secondaries			
7.	Rated frequency (Hz)			
8.	Rated output of each secondary winding (VA)			
9.	Total simultaneous burden (VA)			
10.	Rated total thermal burden (VA)			
11.	Highest system voltage (kV)			
12.	Rated voltage factor and corresponding rated time			
13.	Accuracy class of each secondary winding			
14.	Capacitance			
	i. of high voltage capacitor (pF)			
	ii. of intermediate voltage capacitor (pF)			
15.	Carrier frequency coupling (pF)			
16.	Natural frequency of coupling (kHz)			
17.	Self tuning frequency of CVT (kHz)			
18.	Band width (kHz)			
19.	One minute power frequency test voltage of secondary winding (kV rms)			
20.	One minute power frequency test voltage of H.F. terminal (kV rms)			



7.0 CAPACITOR VOLTAGE TRANSFORMERS & VOLTAGE TRANSFORMERS				
S.No	Description	Offered Data		
		132KV CVT	33KV PT	11KV PT
21	One minute power frequency test voltage of capacitor (kV rms) (dry & wet)			
22	1.2/50 micro s impulse withstand test voltage of Capacitor (kVp)			
23	250/2500 micros switching surge withstand voltage of capacitor (dry & wet) (kVp)			
24	Corona extinction voltage (kV rms)			
25	Max. Radio interference voltage at 1.1 Ur/Root 3 at 1.0 MHz (Micro volts)			
26	Total weight (kg)			
27	Quantity of oil (litres)			
28	Whether CVTs are hermetically sealed. If so. How			
29	Compliance to technical specification w.r.t			
	i) Bushing Insulator			
	ii) Control Cabinet			
	iii) Terminal Connectors			
30	Whether similar equipment is type tested as per IEC 186 and in successful operation for at least 2 (two) years			
31	Overall General Arrangement drawing of CVT is to be enclosed.			



Handwritten signature

(Bidder's Name)

8.0 ISOLATORS / GROUNDING SWITCHES

S.No.	Description			
		132KV	33KV	11KV
1.	Name and address of the Manufacturer			
2.	Manufacturer's type designation			
3.	Standard applicable			
4.	Rated Voltage Ur			
5.	Rated Current under site conditions at 50 deg.C ambient (Amps)			
6.	Rated frequency (Hz)			
7.	Number of poles			
8.	Whether all 3 poles are ganged mechanically			
9.	Pole to pole spacing (mm)			
10.	Rated short time current of isolator and earth switch for 1(one) second and dynamic current			
11.	Opening time of isolator and earth switch			
12.	Closing time of isolator and earth switch			
13.	Rated mechanical terminal load			
14.	Dielectric withstand capacity of completely assembled isolator/ earth switch			
15.	One minute dry power frequency withstand test voltage			
	i) against ground (kVrms)			
	ii) across isolating distance (kVrms)			
16.	1.2/50 micro sec impulse withstand test voltage			
	i) against ground (kVp)			
	ii) across isolating distance (kVp)			
17.	250/2500 micro sec switching surge withstand test voltage (dry & wet)			
	i) against ground (kVp)			
	ii) across isolating distance (kVp)			
18.	Corona Extinction voltage (kVrms)			
19.	Radio interference level at 1.1 Ur/ root 3 (in micro volts) at 1 MHz			
20.	Operating Mechanism			
	i) For main blades			
	ii) For earth switches			
21.	Controls			
	i) Rated DC control voltage (V)			
	ii) Limits of voltage			
22.	Constructional Features			
	i) Main Contacts			



Handwritten signature

8.0 ISOLATORS / GROUNDING SWITCHES

S.No.	Description			
		132KV	33KV	11KV
	a) Type of contacts			
	b) Contact Area (sq.cm)			
	c) Material of contact			
	d) Contact pressure (kg/sq.cm)			
	e) Max. current density under (A/sq.cm) normal current carrying capacity			
	f) Thickness of silver plating (Microns)			
23	Compliance to Technical specification w.r.t			
	i) MOM Box			
	ii) Support insulators			
	iii) Terminal Connectors iii) YES / NO			
24	Whether similar equipment are type tested as per IEC and are in successful operation for at least 2 (two) years			
25	Overall General Arrangement drawing of Isolator/ Earth switch is to be enclosed.			



Handwritten signature

(Bidder's Name)

9.0 LIGHTING SYSTEM

Sl. No	Description	Offered Data
A.	LIGHTING FIXTURES & ACCESSORIES	
1.0	Manufacturer's Name & address	
	a) Fixtures b) Accessories	
2.0	Applicable Standards for	
	a) Fixtures b) Accessories	
4.0.	Maximum permissible supply voltage variation for satisfactory operation of	
	a) Fixtures	
	b)Accessories	
B.	CONDUIT & ACCESSORIES (FOR EACH TYPE & SIZE)	
1.0	Manufacture's Name & address	
2.0	Manufacturer's type, designation	
3.0	Applicable standard	
C.	JUNCTION BOXES (FOR EACH TYPE & SIZE)	
1.0	Manufacture's Name & address	
2.0	Manufacturer's type, designation	
3.0	Type of enclosure	
D.	LIGHTING PANELS (FOR EACH TYPE & SIZE)	
1.0	Manufacture's Name & address	
2.0	Type	
3.0	Degree of Protection	
E	LIGHTING TRANSFORMER	
1.0	Manufacture's Name & address	
2.0	Type	
3.0	Rating	
4.0	Standards Applicable	
5.0	Degree of protection for Enclosure	
F	LIGHTING POLES	
1.0	Manufacture's Name & address	
2.0	Type	
3.0	Dimension	
G.	LIGHTING WIRES	
1.0	Manufacture's Name & address	
2.0	Voltage Grade	
3.0	Cross section of conductor	
4.0	Insulation Thickness	



Handwritten signature/initials

(Bidder's Name)

10.0 Power Transformer

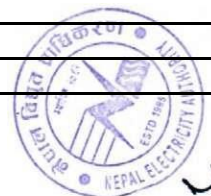
		Offered Data	
S.N.	Bidders/ Description	132/33kV, 24/27/30 MVA	33/11kV, 12.8/16 MVA
1	Name of manufacturer		
2	Normal full load single phase/three phase output:		
	H.V. Winding (KVA)		
	L.V. Winding (KVA)		
2.1	Temp. Rise as specified in the specification.		
3	Continuous single phase/three phase output under, Site conditions as specified in the specification		
	H.V. Winding (KVA)		
	L.V. Winding (KVA)		
4	Type of cooling and corresponding normal Full load output		
	H.V. Winding (KVA)		
	L.V. Winding (KVA)		
5	Over load capacity starting from Full load and with Temp. as specified in the Specification (KVA)		
6	Normal ratio of transformation		
7	Connection (including vector group reference & Symbol)		
	H. V. Winding		
	L.V. Winding		
8	Type of tap changer		
9	Tapping		
	a) Number		
	b) Range		
	c) Location		
10	Details of Automatic Voltage Regulator		
	(a) Make		
	(b) Model etc.		
	(c) Short description (other)		
11	Type of core construction		
12	i) Temp. rise by resistance of winding (°C)		
	ii) Temp. rise in oil by thermometer (°C)		
	iii) Hot spot temp. for which the transformer is designed (°C)		
13	Limit for hot spot temp. for which the transformer is designed (°C)		
14	Guaranteed no load loss at rated voltage & rated frequency and 75°C average winding temperature (KW)		
15	Guaranteed load losses at rated current rated voltage, rated frequency and 75 °C average winding temp. KW (excluding auxiliary losses)		
	for ONAN cooling		
	for ONAF cooling		
	for ODAF cooling		
16	a) Auxiliary losses at rated output – KW		
	b) Total losses at normal ratio, rated output, rated voltage, rated frequency and maximum attainable temp. at site including auxiliary losses – KW		
	(c) Stray eddy losses as % of total losses		



Handwritten signature/initials in blue ink.

10.0 Power Transformer

S.N.	Bidders/ Description	Offered Data	
		132/33kV, 24/27/30 MVA	33/11kV, 12.8/16 MVA
17	Exciting current power factor (Amp. %)		
	i) At normal voltage & frequency		
	ii) At maximum voltage and normal frequency		
18	Efficiency at 75 °C Unity P.F.		
	i) On 100% load (%)		
	ii) On 75% load (%)		
	iii) On 50% load (%)		
	iv) On 25% load (%)		
19	Efficiency at 75 °C 0.8 P.F. (Lag)		
	i) On 100% load (%)		
	ii) On 75% load (%)		
	iii) On 50% load (%)		
	iv) On 25% load (%)		
	v) Load at which maximum efficiency occurs (% of full load)		
20	Maximum efficiency (%)		
21	a) Percentage reactance at rated current and frequency		
	b) Percentage impedance at rated current and frequency at 75 °C		
	i) Positive sequence		
	ii) Zero sequence		
	c) Range of variation (+,-) offered		
	d) Tolerance applicable if any		
22	Impedance voltage drop at normal ratio at 75°C expressed as a percentage of normal voltage on full load (%)		
23	Regulation on full load at unity P.F. at 75 °C expressed as a percentage of normal voltage (%)		
24	Regulation on full load 0.8 P.F. lagging at 75°C expressed as a percentage in the winding		
25	Maximum current density & c/s area in the winding (Guaranteed and As per SC calculation)		
	i) H.V. (Amp./Sq. cm.)		
	ii) Cross sectional area		
	iii) L.V. (Amp/Sq. cm)		
	iv) Cross sectional area		
26	Maximum flux density in the core		
26.a	Core details		
	i) Material of core lamination		
	ii) Thickness of core plates (mm)		
	iii) Insulation of core lamination		
	iv) Insulation of core clamping plates		
	v) Press board material & thickness		
	vi) Prime quality grade		
27	Core joints (butt or inter leave)		
28	Type of winding		
	i) H.V.		
	ii) L.V.		
29	Type of radial support		
	i) High Voltage Winding		
	ii) Lower Voltage Winding		
30	Insulation of higher voltage winding		



Handwritten signature/initials

10.0 Power Transformer

S.N.	Bidders/ Description	Offered Data	
		132/33kV, 24/27/30 MVA	33/11kV, 12.8/16 MVA
31	Insulation of lower voltage winding		
32	Thickness of transformer tank plates		
	i) Sides (mm)		
	ii) Bottom (mm)		
	iii) Cover (mm)		
	iv) Radiator (mm)		
33	(A) POWER FREQUENCY WITHSTAND VOLT		
	i) Test voltage for 1 min. P.F. withstand test on live end of high voltage winding (KV rms)		
	ii) Test voltage for 1 min. P.F. withstand test on neutral end of high voltage winding (KV rms)		
	iii) Test voltage for 1 min. P.F. withstand test on live end of low voltage winding (KV rms)		
	(B) IMPULSE TEST		
	i) Test voltage for 1.2/50 micro sec. Full wave withstand test on high voltage winding (KV crest) on		
	ii) Test voltage for 1.2/50 micro sec. Full wave withstand test on low voltage winding (KV crest) on		
34	Inter-turn Insulation		
	i) Extent of end turns reinforcement		
	ii) Extent of reinforcement of turns adjustment to tap		
	iii) Test voltage for 1 min. 50 Hz. Inter-turn insulation test on (i) (KV rms)		
	iv) Test voltage for 1 min. 50 Hz. inter-turn insulation test on (ii) (KV rms)		
	v) Test voltage for 1 min. 50 Hz. inter-turn insulation test on main body of the winding (KV rms)		
35	Type of winding temperature indicator		
36	Maxi continuous ratings		
	i) At 50 C ambient air temp. at site (KVA)		
	ii) At 40 C ambient air temp. at site (KVA)		
	iii) At 30 C ambient air temp. at site (KVA)		
	iii) At 20 C ambient air temp. at site (KVA)		
37	Details of Air cell		
	Make		
	Type		
	Capacity		
	Size		
38	Width of track gauge (Meters)		
39	Bushing Particulars		
	(a) HV Bushing		
	i) Type of high voltage bushing and creepage distance in mm		
	ii) Rated current		
	iii) STC rating for 3 sec		
	iv) Weight of high voltage bushing in Kg		
	v) Quantity of oil in one high voltage bushing Insulator, in litre		
	vi) Dry 1 minute power frequency test voltage value of high voltage bushing in KV		
	vii) Wet 10 second power frequency test voltage value of high voltage bushing in KV		



Yamaj

10.0 Power Transformer

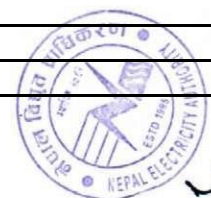
		Offered Data	
S.N.	Bidders/ Description	132/33kV, 24/27/30 MVA	33/11kV, 12.8/16 MVA
	viii) Impulse withstand test voltage value with 1.2/50 microsecond full wave of high voltage bushing in KV		
	(b) LV Bushing		
	i) Type of low voltage bushing and creepage distance in mm		
	ii) Rated current		
	iii) STC rating for 3 sec		
	iv) Weight of low voltage bushing in Kg		
	v) Quantity of oil in one low voltage bushing Insulator, in litre		
	vi) Dry 1 minute power frequency test voltage value of low voltage bushing in KV		
	vii) Wet 10 second power frequency test voltage value of low voltage bushing in KV		
	viii) Impulse withstand test voltage value with 1.2/50 microsecond full wave of low voltage bushing in KV		
	(c) NEUTRAL Bushing		
	i) Type of low voltage bushing and creepage distance in mm.		
	ii) Rated current		
	iii) Weight of bushing insulator in kg		
	iv) Quantity of oil in one bushing in litres		
	v) Dry 1 minute power frequency withstand and test voltage value of bushing in KV		
	vi) Wet 10 second power frequency withstand test voltage value of bushing in KV		
	vii) Impulse withstand test voltage with 1.2/50 microsecond fall wave of bushing in KV		
40	Clearance		
	a) Minimum clearance between phase (Mtrs.)		
	i) In oil		
	ii) Out of oil		
	b) Minimum clearance of high voltage to earth in oil (Mtrs)		
	c) Minimum clearance of high voltage to tank in oil (Mtrs)		
41	Net weight of the core (Kgs.)		
42	Net weight of copper (Kgs.)		
	a) H.V. (Kgs.)		
	b) L.V. (Kgs.)		
	c) Total (Kgs.)		
43	Weight of core and windings		
44	Weight of fittings		
45	Net untanking weight(Kgs.)		
46	Weight of tank and cover (Kgs.)		
46.1	Tank dimensions		
46.2	Guarantee against leakage for 3 years		
47	Weight of oil in transformer including bushings, conservator and cooling system (Kgs.)/Quantity (Ltrs.)		
48	Weight of oil in transformer (including bushings) (Kgs)		
49	Weight of complete transformer with oil and all fittings (Kgs.)		



Handwritten signature/initials

10.0 Power Transformer

S.N.	Bidders/ Description	Offered Data	
		132/33kV, 24/27/30 MVA	33/11kV, 12.8/16 MVA
50	Weight of transformer with all fittings but without oil (Kgs.)		
51	Weight of the package to be transported and dimensions		
52	Dimensions of the transformers		
	i) Maximum height upto top of bushings (Mtrs.)		
	ii) Overall length (Mtrs.)		
	iii) Overall width (Mtrs.)		
53	Minimum clear height for lifting core and windings from tank in meters		
54	Details of on load tap changing gear		
	a) Make		
	b) Type		
	c) Rating		
	i) Rated Voltage		
	ii) Rated current		
	iii) Step Voltage		
	iv) STC rating		
	d) Time for complete tap change (Sec.)		
	e) Diverter selector switch transition time (Cycles)		
	f) Control		
	g) Auxiliary supply details		
	h) Voltage control		
	i) Protection devices		
	j) Value of Maxi. Short circuit current		
	k) Maxi. Impulse withstand test voltage value with 1.2/50 microsecond full wave between switch and ground		
	l) Maxi. Impulse withstand test voltage value with 1.2/50 micro sec. Full wave between the remote terminal and ground with the selector terminal at one end of the range		
	m) Maxi. Power frequency test voltage between switch assembly and range		
	n) Maxi. Impulse withstand test voltage with 1.2/50 micro sec. across the tapping range		
	o) Maxi. Temp. of the tap changer which must not be exceeded during operation :		
	p) Approximate overall weight (kg)		
	q) Approximate overall dimensions (Mtrs)		
	r) Approximate overall quantity of oil (Kgs.)		
55	No. of operations (approx.) after which the change of oil is necessary :		
56	Any other particulars which need a mention		
57	Cooling calculation shall be submitted		
58	OIL LOAD TAPCHANGING GEAR		
	i) Make		
	ii) Type designation		
	iii) Suitable for auto/manual operation (YES / NO)		
	iv) Rated voltage (KV)		
	v) Rated current (Amps)		
	vi) Step voltage (Volts)		



Handwritten signature/initials

10.0 Power Transformer

		Offered Data	
S.N.	Bidders/ Description	132/33kV, 24/27/30 MVA	33/11kV, 12.8/16 MVA
	vii) Number of steps		
	viii) Rated voltage of drive motor (V)		
	ix) List of routine tests to be carried out		
	x) Location of the taps with respect to the terminals of the tapped winding		
	xi) Drawing or pamphlet-number of the technical and descriptive particulars of the OLTC, enclosed with the Bid.		



Handwritten signature

(Bidder's Name)

11.0 LT Switchgear

Sl. No	Description	Offered Data
1	Manufacturer's Name	
2	Whether Manufacturer's have supplied 50 Nos draw out Air circuit breaker Panels out of which 5 Nos. are with CT and relaying scheme.	
3.	Whether Manufacturer's have supplied 50 Nos. MCC panels similar to the offered panels.	
4.	Whether 100 nos.(at least) circuit breakers of the make and type being offered are already been operating satisfactorily.	
4.	Rated short circuit current	
5.1	Symmetrical short circuit withstand current at rated voltage of switchgear cubicle	
5.2	Peak short circuit withstand current	
6.	Degree of protection	
6.1	Breaker/MCC/AC & DC	
6.2	Distribution Cubicles	
6.3	Busbar chamber	
7.	Standard height, width & depth of typical panel	
7.1	Circuit Breaker Panel	
7.2	MCC panel	
7.3	AC/DC Distribution Board	
8.	Width of cable alley	
9.	Whether equipment are type tested as per IEC	



Handwritten signature/initials

(Bidder's Name)

12 600 V Power and Control Cables

Sl.No	Description	Offered Data
1	Manufacturer's name and address	
2	Manufacturer's type & designation	
3	Applicable standards	
4	Rated Voltage (Volts)	
5	Suitable for earthed or unearthed system?	
6	Continuous current rating when laid in air in an ambient temp. of 50deg.C and for maximum conductor temp. of 70 deg.C for PVC cable	
7	Short Circuit Capacity	
i.	Short Circuit Current (kArms)	
ii.	Duration of short circuit. (Sec.)	
iii.	Conductor temp. allowed for the short circuit duty (Deg. C)	
iv	Formula relating short circuit current (rms) and duration (Sec.)	
8	Conductor(Circular)	
i.	Material (Copper or aluminium)	
ii.	Grade	
iii.	Normal cross section area (Sq.mm)	
iv	Approx.Number and diameter of wire before stranding(No./mm)	
9	Insulation	
i.	Composition of insulation	
ii.	Nominal thickness of insulation (mm)	
10	Inner Sheath	
i.	Material	
ii.	Calculated diameter over the laid up cores, (mm)	
iii.	Thickness of Sheath (minimum) mm	
11	Armour	
i.	Type and material of armour (wire / strip)	
ii.	Calculated diameter under armour (mm)	
iii.	Nominal diameter of round armour wire	
iv	Nominal size of strip	
v	Short circuit capacity armour alongwith formulae(kA)	
vi	Maximum D.C. resistance at 20deg.C	



Handwritten signature/initials

12 600 V Power and Control Cables

Sl.No	Description	Offered Data
12	Outer Sheath	
i.	Material	
ii.	Calculated diameter under sheath	
13	Safe pulling force when pulled by pulling eye on the conductor (Kg)	
14	Test Voltage	
i	High Voltage test voltage (kV)	
ii	Water immersion test voltage (kV)	
15	Minimum bending radius permissible	
16	Whether the cables are type tested as per IEC	



Handwritten signature

(Bidder's Name)

13 11 KV XLPE Cables

Sl.No	Description	33kV Single	11 kV Single	11 kV Three
		Core	Core	Core
1	Manufacturer's name and address			
2	Manufacturer's type & designation			
3	Applicable standards			
4	Electrical Data			
a	Rated Voltage (Volts)			
b	Suitable for earthed or unearthed system?			
c	Maximum working voltage(Um)			
d	Frequency (Hz)			
e	Temperature of conductor (°C)			
	Normal operation			
	Short circuit			
f	Suitable cable section			
g	AC voltage test for 5 minutes			
h	AC voltage test for 1 minutes in rain			
i	Partial discharge at room temperature			
j	Load cycle test at constant voltage(23 kV for 11 kV), conductor temperature between 95°C and 100°C cycle 60 times)			
k	Impulse voltage test(±95kV for 11 kV each 10 times, conductor temperature between 95°C and 100°C)			
l	Voltage test for 15 minutes after impulse			
m	Salt fog test for 1000h			
5	ENVIRONMENTAL DATA			
a	Allowed Environmental temperature			
b	Allowed Sea level			
c	Creep distance of outer insulation of accessory			
d	Life expectancy			
6	Conductor(Circular)			
i.	Material (Copper or aluminium) as per BoQ			
ii.	Grade			
iii.	Normal cross section area (Sq.mm)			
iv	Approx.Number and diameter of wire before stranding(No./mm)			
7	Insulation			
i.	Composition of insulation			
ii.	Nominal thickness of insulation (mm)			



Handwritten signature/initials.

13 11 KV XLPE Cables

8	Inner Sheath			
i.	Material			
ii.	Calculated diameter over the laid up cores, (mm)			
iii.	Thickness of Sheath (minimum) mm			
9	Armour			
i.	Type and material of armour (wire / strip)			
ii.	Calculated diameter under armour (mm)			
iii.	Nominal diameter of round armour wire			
iv.	Nominal size of strip			
v.	Short circuit capacity armour alongwith formulae(kA)			
vi.	Maximum D.C. resistance at 20deg.C			
10	Outer Sheath			
i.	Material			
ii.	Calculated diameter under sheath			
11	Whether the cables are type tested as per IEC			



Handwritten signature

(Bidder's Name)

14 Substation Automation System

Si No	Name of the component	Offred Data
I	ETHERNET SWITCH	
	Name & Address of the Manufacturer	
	Model	
	Type of switches	
	Mounting arrangement	
	Power consumption	
	Protocol Supported	
II	SERVER 1&2	
	Make	
	Type/ Model	
	Construction	
	Operating system	
	Processor (Type /Make)	
	Processor speed	
	FSB	
	Chipsel	
	Memory capacity (RAM)	
	Hard disk	
	Ethernet Port	
	Power supply	
	Power consumption	
III	STATION HMI,REDUNDANT AND STATION HMI DR,CUM ENGINEERING WORKSTATION	
	Make	
	Type/ Model	
	Construction	
	Operating system	
	Processor (Type /Make)	
	Processor speed	
	FSB	
	Chipsel	
	Memory capacity (RAM)	
	Hard disk	
	Ethernet Port	
	Power supply	
	Power consumption	
IV	TFT Monitor	
	Name of the Manufacturer	
	Viewable area	
	Contrast Ratio	
	Response time	
	Optimum resolution	
	Frequency	
	Digital Input	
	Operating temperature	
	Dimension (W X H X D)	
	Audio Speaker	
	Display	
	V	TIME SYNCHRONISING EQUIPMENT
Name and address of the Manufacturer		
Reference Standard		
Name of Satellite system and type of time signal		
Number of satellite that can be tracked		
Mounting arrangement		
I/P and O/P ports		
Power supply		
Power consumption		
Operating temperature		



14 Substation Automation System

Si No	Name of the component	Offred Data
	Whether able to give real time IST corresponding to(taking in to consideration all factors like voltage temprature variation & propagation / Processing delay)	
	Accuracy	
	Time display unit	
VI	COLOUR LASER PRINTER	
	Name and address of the Manufacturer	
	Auxiliary voltage	
	Offline/Online mode selector	
	Printer encloser provided	
	Print speed	
	First page out	
	Resolution	
	Processor	
	Standard memory	
	Duty cycle	
	Operating system	
	Network Interface	
	DOT MATRIX PRINTER	
	Name and address of the Manufacturer	
	No of colums	



Handwritten signature

14 Substation Automation System

Si No	Name of the component	Offred Data
VII	Auxiliary voltage	
	Noise Level	
	Interface	
	Built in testing facility	
	Offline or online mode selector	
	Printing Method	
VIII	FIBRE OPTIC PATCH CABLE	
	Name and address of the Manufacturer	
	Wavelength	
	Unarmoured/ Armoured type	
	Type of conectors used	
	Type of cable	
	Proper identification	
	Core diameter	
	Attenuation at 850nm	
	Numerical aperture	
	No of cores per cable	
	Type of Material	
IX	ARMOURED FIBRE OPTIC CABLE	
	Name and Address of Manufacturer	
	Wavelength	
	Type of connectors used	
	Type of cable	
	Core diameter	
	Attenuation at 850nm	
	Numerical aperture	
	No. of cores per cable	
	No. of Spare cores	
	Type of Material	
XI	INVERTER	
	Name and address of the Manufacturer	
	Capacity	
XII	Substation Automation System Software m	
	Make Type	
XIII	Substation Automation System erection & commissioning Agency	
	Name and Address	
	Type of future Service in Nepal	



Handwritten signature

(Bidder's Name)

15.0 SURGE ARRESTERS

S.No.	Description	Offered Data		
		132KV	33KV	11 kV
1	Name and address of Manufacturer			
2	Manufacturer's type designation			
3	Applicable standards			
4	Arrester class and type			
5	Rated arrester voltage (kV)			
6	Rated system voltage (kV)			
8	Maximum continuous operating voltage (COV) at 50 deg.C ambient temperature (kV)			
9	Nominal discharge current(8/20 micro sec.wave) (kA)			
10	Minimum discharge capability (kJ / kV)			
11	(a)Maximum residual voltage at nominal discharge current (kVpeak)			
	b)Minimum residual voltage at nominal discharge current (kVpeak)			
	(c)Maximum residual voltage at 50 % nominal discharge current (kVpeak)			
	(d)Maximum residual voltage at 200% nominal discharge current (kVpeak)			
12	Steep fronted wave residual voltage at 1 KA (kVpeak)			
13	Maximum switching surge impulse residual voltage at 1 KA (kVpeak)			
14	Long duration discharge class			
15	a)High current short duration (4/10 micro-sec wave) in kVpeak			
	b)Low current long duration (2000 microsec.)			
16	Current for pressure relief test (kA)			
17	Pressure relief class (as per IEC 99)			
18	One minute power frequency (dry) withstand voltage of arrester housing (kVrms)			
19	Lightning Impulse withstand test voltage of arrester housing with 1.2/50 microsec wave (kVp)			
20	Switching Surge Impulse withstand test voltage of arrester housing with 250/2500 microsec wave (kVp)			
21	Total creepage distance of whole arrester Housing (mm)			



Handwritten signature/initials

15.0 SURGE ARRESTERS

S.No.	Description	Offered Data		
		132KV	33KV	11 kV
22	Cantilever strength of complete arrester (N)			
23	Total height of the arrester (mm)			
24	Total weight of the arrester (kg)			
25	Maximum radio interference voltage at 1.1 Ur/ root 3 voltage at 1 MHz (microvolts)			
26	Partial discharge at 1.05 continuous operating voltage (pC)			
27	Minimum prospective symmetrical fault current (kArms)			
28	Compliance to technical specification w.r.t			
	i) Surge monitor			
	ii) Support Insulator			
	iii) Terminal connectors			
29	ZnO block details			
	a) Make and size of ZnO block			
	b) Whether equipment type tested with offered type of ZnO block			
30	Whether similar equipment are type tested as per IEC or equivalent standard and are in successful operation for at least two years.			
31	Overall General Arrangement drawing of Surge arrester is to enclosed.			



Handwritten signature

(Bidder's Name)

16.0 INSULATOR , HARDWARES & ACCESSORIES

Sl.No.	Description	Offered Data		
		132kV	33kV	11kV
A.	INSULATOR STRINGS			
1	Manufacturer's name and address			
2	Applicable Standards			
3	No. of Units per String			
	Weight			
4	a) Each Disc (Kg)			
	b) Complete string (hardware only) (Kg)			
	5. Creepage Distance			
5	a) Each Disc (mm)			
	b) Complete String (mm)			
	6. Power Frequency Withstand Voltage of the complete string with corona control ring			
6	i. Dry (KVrms)			
	ii. Wet (KVrms)			
7	7. Lightning Impulse (dry) Withstand Voltage of the Complete string for both positive and negative peaks. (kVp)			
8	8. Switching Surge withstand Voltage of the Complete string with corona control (Wet) (kVp)			
9	9. Power Frequency Puncture Withstand Voltage (Dry & Wet) of each Disc (KV rms)			
10	10. Electro Mechanical Strength of each Disc (Kg)			
11	11. Minimum Corona extinction (kVrms) voltage level of the complete string with corona control ring (Dry Condition)			
12	12. RIV level of the complete (micro-volts) String with corona control ring at 1 MHz when subjected to a test voltage.			
13	13. Confirm whether string type tested with offered disc insulator as per IEC			
B.	INSULATOR			
1	1. Manufacturer's Name and address			
2	2. Applicable Standards			
	3. Ultimate Strength			
3	a) Complete assembly (kg)			
	b) Suspension / drop clamp (kg)			
C.	TUBULAR BUS CONDUCTOR			
1	1. Manufacturer's name and address			



Handwritten signature/initials.

16.0 INSULATOR , HARDWARES & ACCESSORIES

Sl.No.	Description	Offred Data		
		132kV	33kV	11kV
A.	INSULATOR STRINGS			
2	2.Applicable Standards			
3	3.Material			
4	Size of Tubular Bus			
	i.Standard pipe size- IPS (mm)			
	ii.Outside diameter (mm)			
	iii.Tolerance on outside			
	iv.Thickness (mm)			
	v.Tolerance on Thickness			
5	D.C. Resistance of 20 deg.C			
6	Current rating at ambient temperature of 50 deg. C			
7	Short circuit current rating for 1 sec. duration (kA)			
8	Radio Interference at rated voltage (micro volts)			
9	10.Weight (kg/m)			
10	Final allowable tubular bus conductor temperature due to short circuit			
D.	MARSHALLING KIOSK			
1	Manufacturer's Name and address			
2	Thickness of sheet steel (mm)			
3	Degree of protection provided			
E.	BUS POST INSULATORS			
1	Manufacturer's Name and address			
3	Applicable Standards			
4	No. of Units per Stack			
5	Whether corona ring provided or not			
6	Diameter (mm)			
7	Creepage Distance			
	a. Total (mm)			
	b. Protected (mm)			
8	Power Frequency withstand Voltage of Insulator			
	a. One complete stack			
	i. Dry (kV rms)			
	ii. Wet (kV rms)			



16.0 INSULATOR , HARDWARES & ACCESSORIES

Sl.No.	Description	Offred Data		
		132kV	33kV	11kV
A.	INSULATOR STRINGS			
9	1.2/50 microsec.impulse withstand Voltage on complete stack (kVp)			
10	250 /2500 micro second switching Surge withstand voltage			
	a.One complete stack			
	i.Dry (kV peak)			
	ii.Wet (kV peak)			
11	Radio interference Voltage of complete stack			
	i.Test Voltage (kVrms)			
	ii. Radio interference voltage (micro volt)			
12	Weight-of complete stack (Kg)			
13	Cantilever Strength of Complete Stack			
15	Torsional Strength(Kg.m)			
16	Compression Strength (Kg)			
17	Confirm whether type tested as per IEC and are in successful operation for at least 2 (Two) years.			
F.	ACSR CONDUCTOR			
1	Name and address of manufacturer			
2	Standards Applicable			
3	Name & Type of Conductor			
4	No. & diameter of various strands			
5	Overall diameter of the conductor (mm)			
6	Current rating capacity of the Conductor at 75 deg. C (Amps)			
7	Confirm whether type tested as per IEC			
G.	GALVANISED STEEL EARTHWIRE			
1.	Name and Address of the Manufacturer			
2.	Standards Applicable			
3.1	UTS of the Earthwire (kN)			
3.2	Lay length of outer steel layer (mm)			
3.3	DC Resistance of earthwire at 20 deg. C (ohms)			



Handwritten signature

16.0 INSULATOR , HARDWARES & ACCESSORIES

Sl.No.	Description	Offred Data		
A.	INSULATOR STRINGS	132kV	33kV	11kV
3.4	Standard length of earthwire in the drum (metres)			
3.5	Diameter of earthwire			



Handwritten signature or initials in blue ink, possibly reading 'Yanay'.

(Bidder's Name)

17 200 KVA 33/0.4 kV, LT Transformer

Item	Description	Units	33/ 0.4 kV
1	Manufacturer		
1.1	Type	-	
1.2	Class		
2	Rated data and characteristics		
2.1	Rated power: - primary/secondary (Rated power at highest tap)	kVA	
2.2	Cooling method	-	
2.3	Rated voltage		
	- HV winding	kV	
	- LV winding	kV	
2.4	Tap changer:		
	- manufacturer	-	
	- model	-	
	- type	-	
	- regulating range	%	
	- rating	A	
2.5	Frequency	Hz	
2.6	Connection of the three-phase windings (group of vectors IEC 60076)	-	
2.7	Rated current at ONAN rated power and rated voltage tap:		
	- HV winding	A	
	- LV winding	A	
2.8	No-load current through:		
	- HV winding	A	
	- LV winding	A	
2.9	Short circuit impedance		
2.9.1	Direct impedance at nominal voltage tap: - HV/LV	%	
2.9.2	Direct impedance at minimum voltage tap: - HV/LV	%	
2.9.3	Direct impedance at maximum voltage tap: - HV/LV	%	
2.9.4	Zero sequence impedance at nominal voltage tap: - HV / LV	%	
2.1	Tolerance to be applied to the short circuit impedance, in terms of % of the guaranteed value on:		
	- nominal voltage tap	%	



Handwritten signature/initials.

17 200 KVA 33/0.4 kV, LT Transformer

Item	Description	Units	33/ 0.4 kV
	- other taps	%	
2.11	Transformer capacity to withstand external short circuits:		
2.11.1	Short circuit duration	sec	
2.11.2	Symmetrical short circuit current withstand during the indicated period and asymmetrical short circuit withstand:		
	- HV winding	kA RMS kA (peak)	
	- LV winding	kA RMS kA (peak)	
	- pre-fault voltage	p.u.	
2.12	Guaranteed losses		
2.12.1	No-load losses at rated voltage and frequency, with rated voltage tap (design calculation sheet shall be submitted with the bid)	kW	
2.12.2	No-load losses at 110% of the rated voltage, at rated frequency and rated voltage tap	kW	
2.12.3	Tolerance to be applied to no-load losses (in % of the guaranteed value)	%	
2.12.4	Load losses at rated voltage and frequency, with rated voltage tap and ONAN rating:	kW	
	- HV winding (design calculation sheet shall be submitted with the bid)	kW	
	- LV winding (design calculation sheet shall be submitted with the bid)	kW	
	- Stray loss	kW	
2.12.5	Tolerance to be applied to total losses (in % of the guaranteed value) for all the windings	%	
2.13	Highest voltage for equipment:		
	- HV winding	kV	
	- LV winding	kV	
2.14	Rated insulation level:		
2.14.1	Short time power frequency withstand:		
	- HV winding - line terminal	kV RMS	
	- LV winding - line terminal	kV RMS	
	- neutral	kV RMS	
2.14.2	Basic impulse level:		



Handwritten signature or mark.

17 200 KVA 33/0.4 kV, LT Transformer

Item	Description	Units	33/ 0.4 kV
	- HV winding - line terminal	kV (peak)	
	- LV winding - line terminal	kV (peak)	
	- neutral point	kV (peak)	
2.15	Temperature rise limits at maximum power output ratings and at lowest voltage tap and corresponding voltage:		
	- average winding at ambient temperature	°C	
	- top oil at ambient temperature	°C	
2.16	Permissible overload in emergency cases:		
	- permanent permissible overload based on highest winding temperature which exceeds by 5°C the guaranteed limit	kVA	
	- permanent permissible overvoltage based on the maximum top oil temperature which exceeds by 5°C the guaranteed limit at rated power (in % of the rated voltage)	%	
2.17	Audible noise level		
	- Voltage in percent of rated value	%	
	- ONAN rating	dB(A)	
2.18	Radio Interference Voltage at 0.5 MHz as per IEC 60694	µV	
2.19	Core:		
	- manufacturer	-	
	- grade and thickness of core steel	grade/mm	
	- standard	-	
	- data sheet attached	-	
2.2	Oil:		
	- manufacturer	-	
	- type	-	
	- standard	-	
	- data sheet attached	-	
2.21	Tank /corrugated wall and radiators		
2.21.1	Tank/corrugated wall :		
	- manufacturer	-	
	- thickness		
	- cover	mm	
	- side/corrugated wall	mm	
	- bottom	mm	
2.21.2	Radiator :		
	- manufacturer	-	
	- cooler tube thickness	mm	
	- pressed-sheet radiator thickness	mm	



Handwritten signature/initials.

17 200 KVA 33/0.4 kV, LT Transformer

Item	Description	Units	33/ 0.4 kV
2.21.3	Safe withstand vacuum at sea level	kPa	
2.22	Bushings		
2.22.1	HV bushings:		
	- class	kV	
	- manufacturer	-	
	- type designation	-	
	- rated current	A	
	- short circuit withstand	kA RMS	
	- basic insulation level	kV (peak)	
	- power frequency withstand for 1 minute	kV RMS	
	- terminal connector for conductor size	mm ²	
	- creepage distance	mm	
2.22.2	LV bushings:		
	- class	kV	
	- manufacturer	-	
	- type designation	-	
	- rated current	A	
	- short circuit withstand	kA RMS	
	- basic insulation level	kV (peak)	
	- power frequency withstand for 1 minute	kV RMS	
	- terminal connector for conductor size	mm ²	
	- creepage distance	mm	
2.22.3	Neutral bushings:		
	- class	kV	
	- manufacturer	-	
	- type designation	-	
	- rated current	A	
	- short circuit withstand	kA RMS	
	- basic insulation level	kV (peak)	
	- power frequency withstand for 1 minute	kV RMS	
	- terminal connector for conductor size	mm ²	
	- creepage distance	mm	
3	Design data:		
3.1	Core Design		
	- core type	core or shell	
	- number and length of limbs	no/mm	
	- core diameter	mm	
3.1.1	Core cross section area		
	- wound limbs	mm ²	
	- yoke	mm ²	



Handwritten signature/initials.

17 200 KVA 33/0.4 kV, LT Transformer

Item	Description	Units	
			33/ 0.4 kV
	- unwound limbs	mm ²	
3.1.2	Distance between core limb center	mm	
3.1.3	Maximum flux density in the wound limb at:		
	- rated voltage	tesla	
	- 110% of the rated voltage	tesla	
3.1.4	Maximum flux density in the yokes at:		
	- rated voltage	tesla	
	- 110% of the rated voltage	tesla	
3.1.5	Voltage per turn at the above flux density		
	- rated voltage	V	
	- 110% of the rated voltage	V	
3.1.6	Magnetizing current, at rated frequency, on principal tapping, in percent of rated current at maximum HV rating	%	
	- at 90% of the rated voltage	%	
	- at 100% of the rated voltage	%	
	- at 110% of the rated voltage		
3.1.7	Specific loss of core at maximum flux density	W/kg	
3.1.8	Maximum current density in winding;		
	- HV	A/mm ²	
	- LV	A/mm ²	
3.2	Winding Design		
3.2.1	Winding resistance:		
	- HV winding	ohms	
	- winding conductor	-	
	- Inside diameter of winding coil	m	
	- Outside diameter of winding coil	m	
	- Number of winding turn at normal tap	turns	
	- Cross-section area of winding conductor	mm ²	
	- number and width of support spacers per turn	-	
	- total conductor mass	kg	
	- dry insulation mass	kg	
	- LV winding	ohms	
	- winding conductor	-	
	- Inside diameter of winding coil	m	



Handwritten signature

17 200 KVA 33/0.4 kV, LT Transformer

Item	Description	Units	33/ 0.4 kV
	- Outside diameter of winding coil	m	
	- Number of winding turn at normal tap	turns	
	- Cross-section area of winding conductor	mm ²	
	- number and width of support spacers per turn	-	
	- total conductor mass	kg	
	- dry insulation mass	kg	
3.3	Voltage regulation at ONAN rating and rated voltage tap (in % of the rated voltage):		
	- with unity power factor:		
	- with 0.9 power factor (lagging):	%	
	- with 0.8 power factor (lagging):	%	
4	Weights and dimensions		
4.1	Total weight of transformer, equipped for service	kg	
4.2	Weight:		
	- oil	kg	
	- core and coil assembling	kg	
	- tank and accessories	kg	
	- net copper	kg	
	- net core steel	kg	
4.3	Outline dimensions:		
	- length	mm	
	- width	mm	
4.4	Layout drawing no.	-	
5	Standards		
5.1	Manufacturing	-	
5.2	Quality assurance	-	
5.3	Type test certification	-	
	<i>(shall be submitted with the bid for approval otherwise it will be assumed that no type tests for identical units are available)</i>		
6	Installation	-	



Handwritten signature/initials

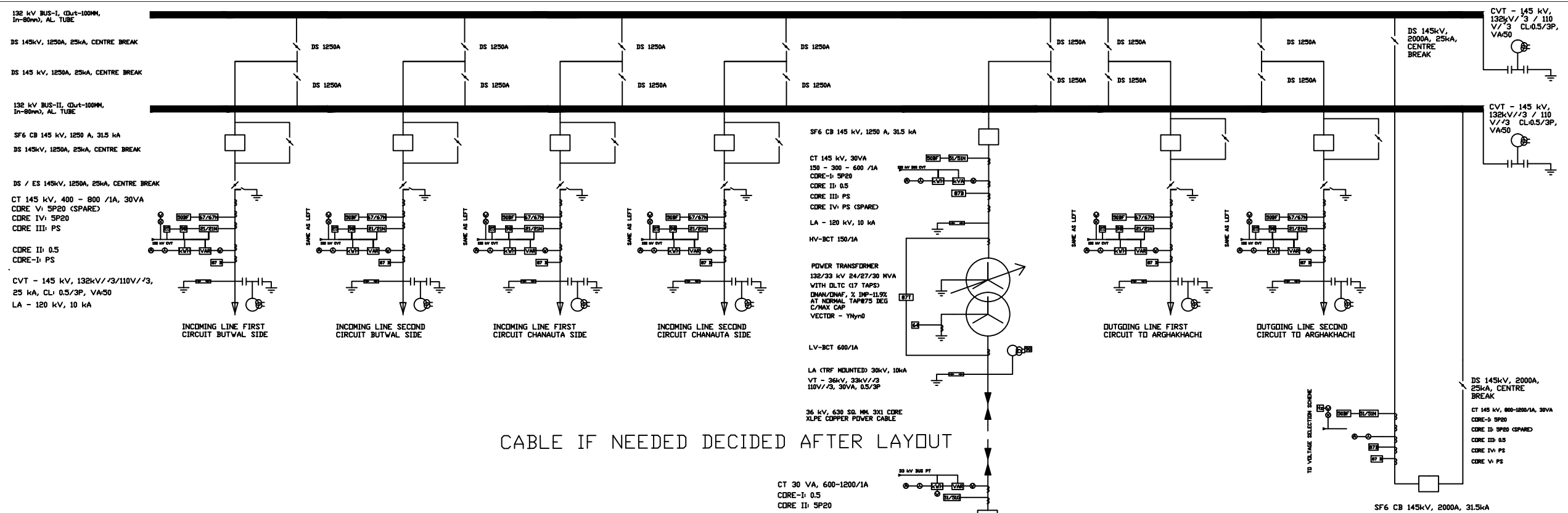
(Bidder's Name)

18 Communication Equipments

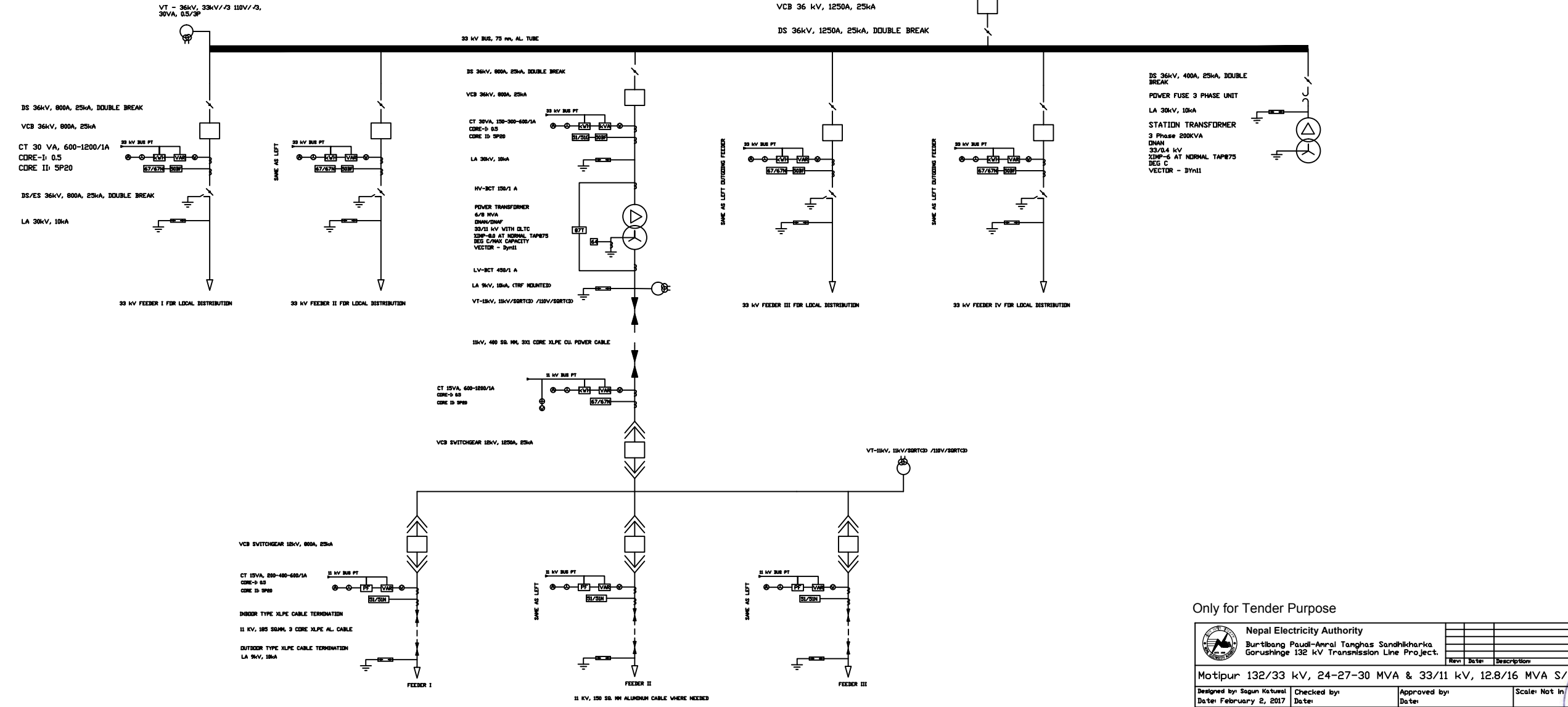
S.N	Parameters:	Offered Data
A	OPTICAL LINE TERMINATION EQUIPMENT(OLTE)	
1	SDH hierarchy level:	
	Capacity Aggregate Bit-rate:	
	CEPT E-1 Ports:	
2	Minimum No. of protected (MSP) directions	
3	No. of E1 ports in E1 tributary cards	
4	No. of ethernet ports in Ethernet interface tributary cards	
5	Service Channel provision	
	a) Voice Channel	
	b) Data Channel	
6	Power Supply cards of SDH equipment	
	Common Control* Card of SDH equipment	
B	Primary Multiplexer/Drop & Insert Multiplexer	
SN	Parameter	
1	Output Aggregate Rate	
2	Interface Code	
3	Impedance	
4	Maximum Insertion Loss	
5	Power Supply card of multiplexer	



Handwritten signature

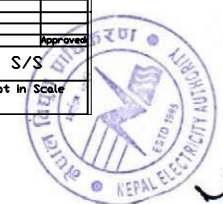


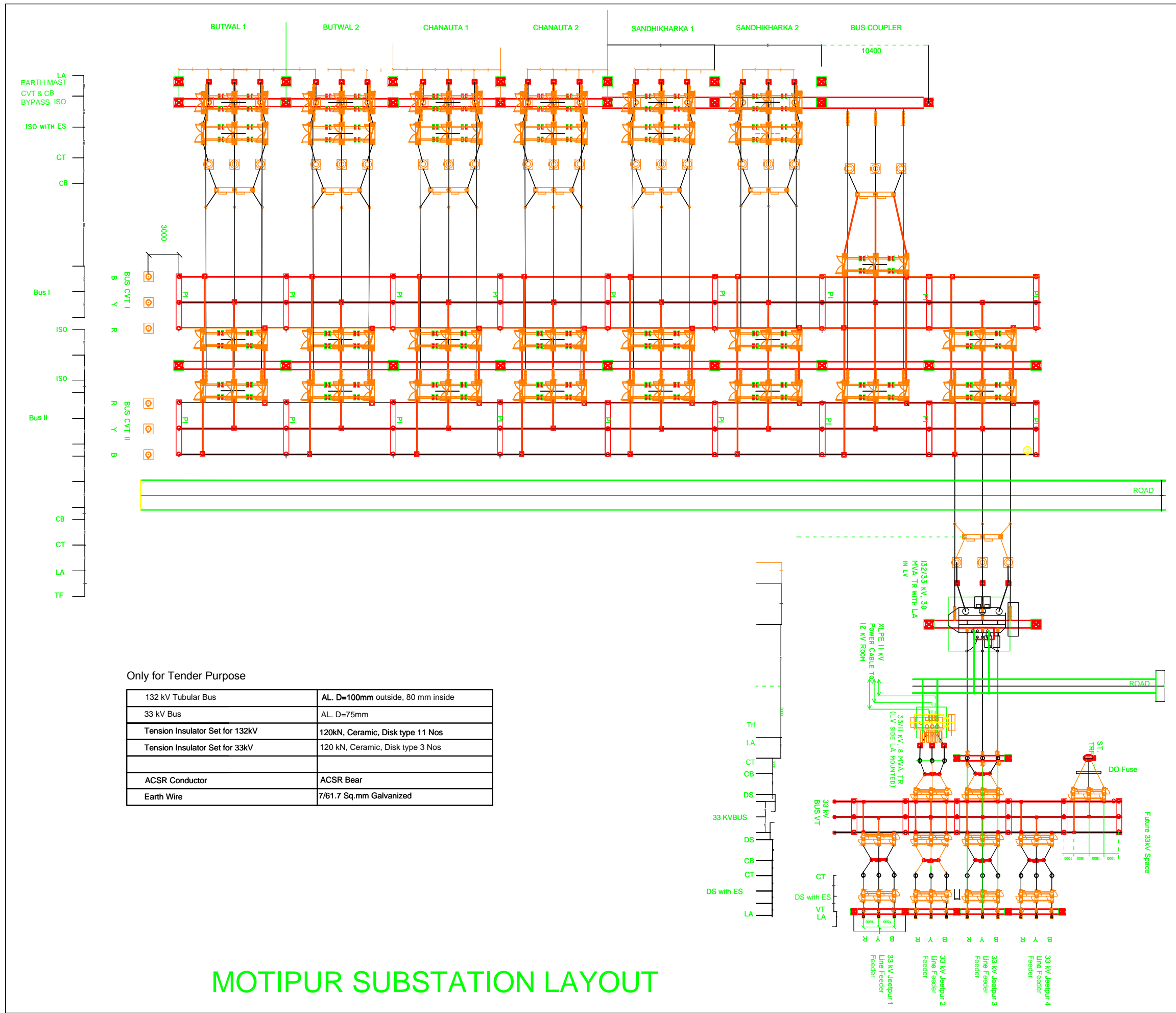
CABLE IF NEEDED DECIDED AFTER LAYOUT



Only for Tender Purpose

		Nepal Electricity Authority Birtimang Paudyal-Amral Tanghas Sandhikharika Gorushinge 132 kV Transmission Line Project	
Motipur 132/33 kV, 24-27-30 MVA & 33/11 kV, 12.8/16 MVA S/S	Rev: _____ Date: _____ Description: _____ Approved: _____	Date: February 2, 2017	Checked by: _____ Date: _____
Designed by: Sagun Kattel	Approved by: _____ Date: _____	Scale: Not in Scale	_____





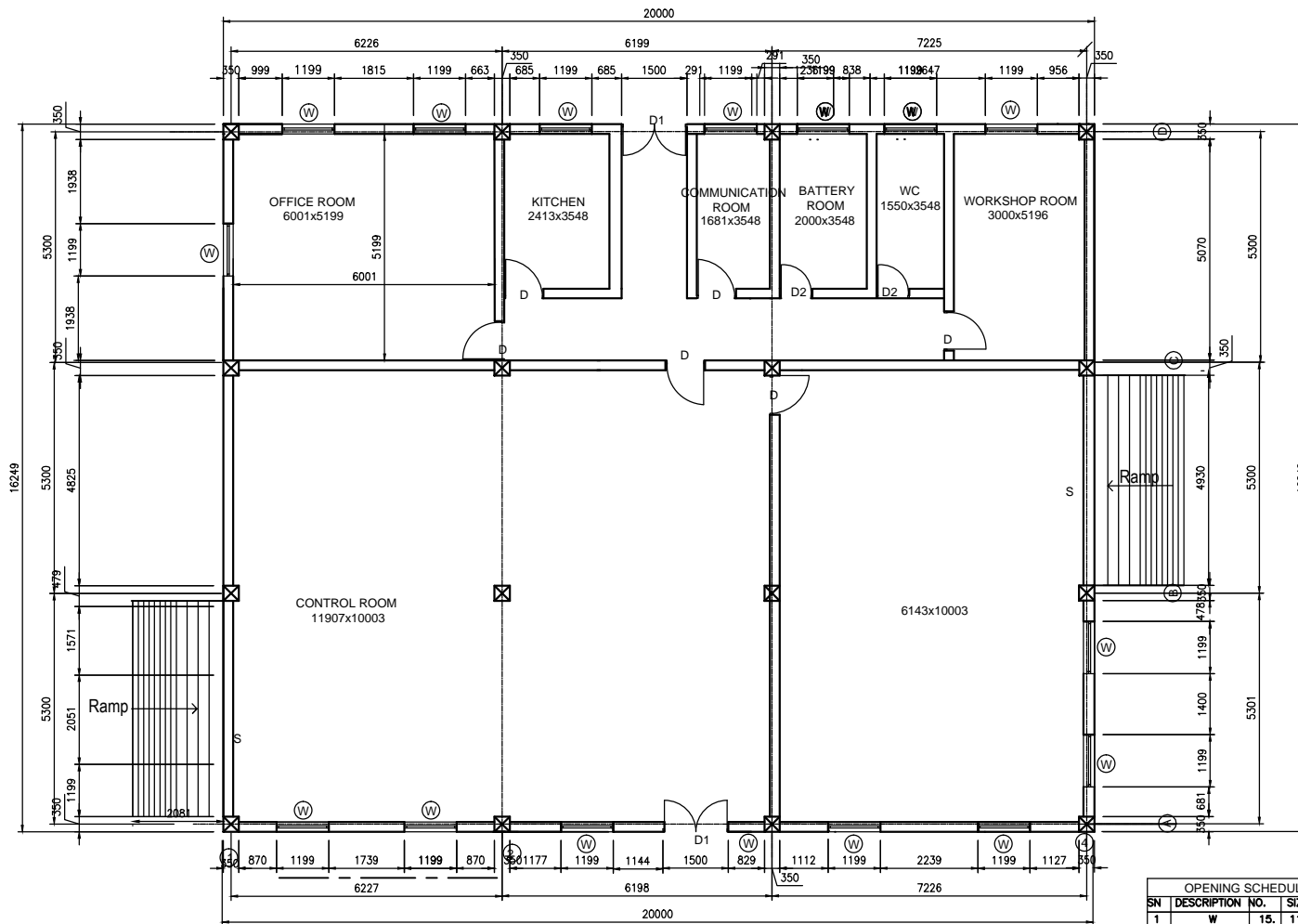
Only for Tender Purpose

132 kV Tubular Bus	AL. D=100mm outside, 80 mm inside
33 kV Bus	AL. D=75mm
Tension Insulator Set for 132kV	120kN, Ceramic, Disk type 11 Nos
Tension Insulator Set for 33kV	120 kN, Ceramic, Disk type 3 Nos
ACSR Conductor	ACSR Bear
Earth Wire	7/61.7 Sq.mm Galvanized

MOTIPUR SUBSTATION LAYOUT



Handwritten signature




PLAN - CONTROL BUILDING

OPENING SCHEDULE		
SN	DESCRIPTION	NO. SIZE
1	W	15. 1199*225
2	D	7. 900*225
3	D1	1. 1200*225
4	D2	1. 750*225
5	S	2. 4575*225



Rev.	Date	Description	Approved


NEPAL ELECTRICITY AUTHORITY
 (GoN Undertaking)

TRANSMISSION DIRECTORATE
 GRID DEVELOPMENT DEPARTMENT

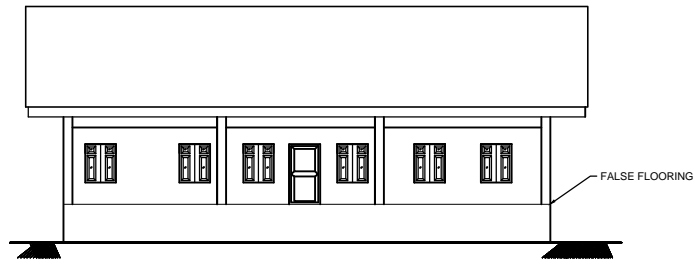
BURTIBANG-PAUDI AMRAI-TAMGASH-
 SANDHIKHARAK-GORUSINGE
 132KV TRANSMISSION LINE PROJECT

Title
 MOTIPUR & SANDHIKHARAK SUB-STATION
 CONTROL BUILDING PLAN

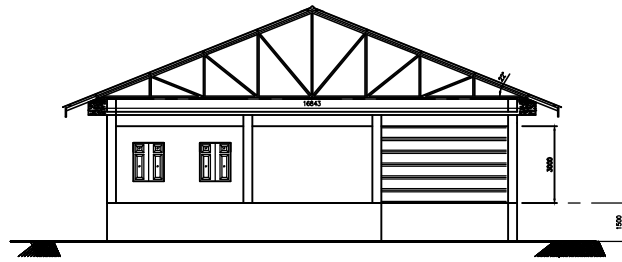
Dwg. No.: 119

For Tender Purpose only

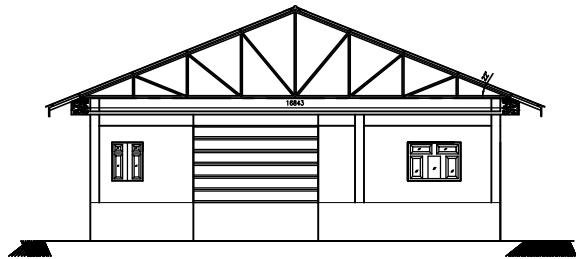




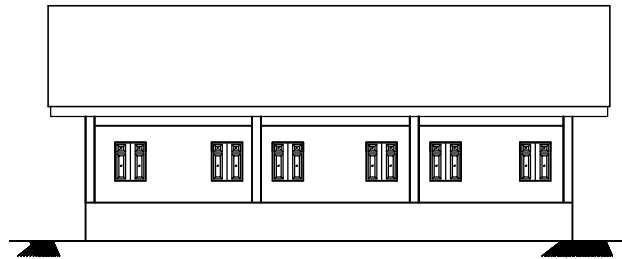
FRONT ELEVATION



SIDE ELEVATION



SIDE ELEVATION



SIDE ELEVATION

Rev.	Date	Description	Approved


NEPAL ELECTRICITY AUTHORITY
 (GoN Undertaking)

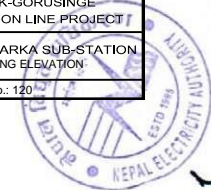
TRANSMISSION DIRECTORATE
 GRID DEVELOPMENT DEPARTMENT

BURTIBANG-PAUDI AMRAI-TAMGASH-
 SANDHIKHARAK-GORUSINGE
 132kV TRANSMISSION LINE PROJECT

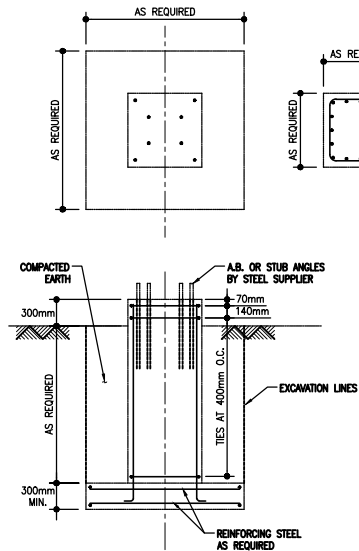
Title
 MOTIPUR & SANDHIKHARKA SUB-STATION
 CONTROL BUILDING ELEVATION

Dwg. No.: 120

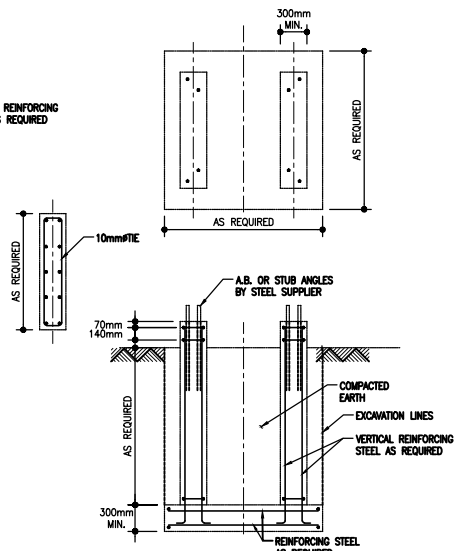
For Tender Purpose only



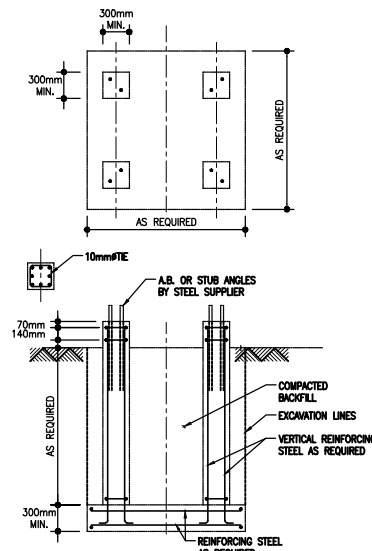
Handwritten signature



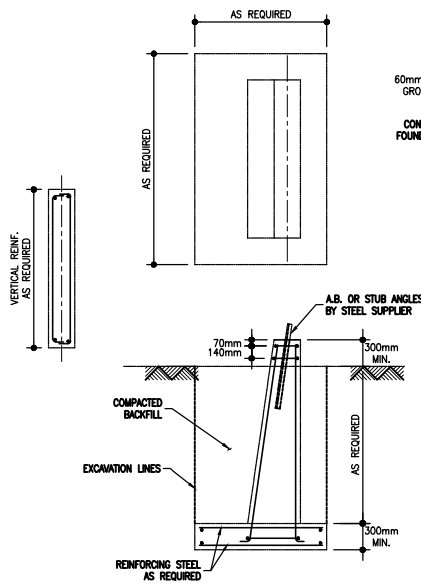
TYPICAL SINGLE PIER SPREAD FOOTING FOR 132KV EQUIPMENT AND EQUIPMENT SUPPORT STRUCTURES



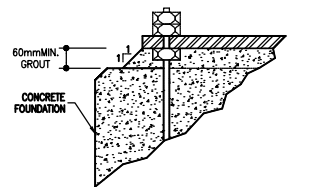
TYPICAL SPREAD FOOTING FOUNDATION WITH TWO PIERS FOR EQUIPMENT AND EQUIPMENT SUPPORT STRUCTURES



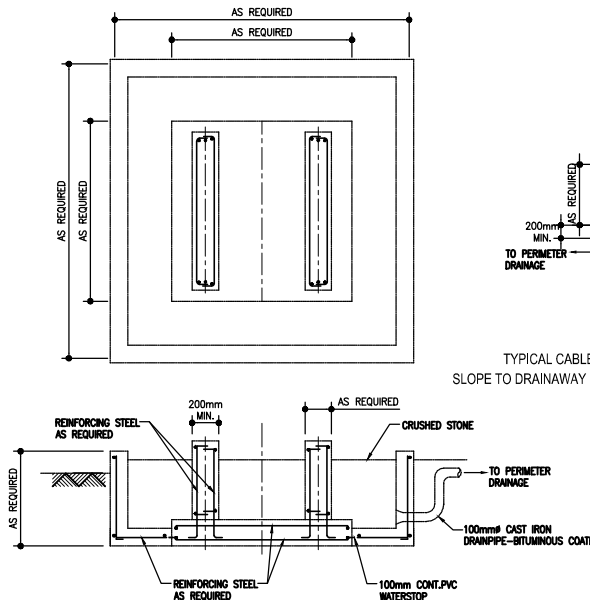
TYPICAL SPREAD FOOTING FOUNDATION WITH FOUR PIERS FOR EQUIPMENT AND EQUIPMENT SUPPORT STRUCTURES



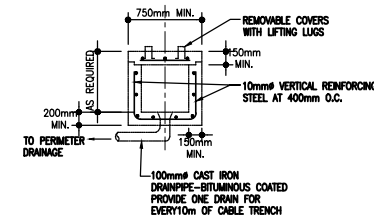
TYPICAL SPREAD FOOTING FOR 132KV GANTRY TOWER



TYPICAL BASEPLATE AND GROUT DETAIL



132KV TRANSFORMER FOUNDATION WITH OIL CONTAINMENT



TYPICAL CABLE TRENCH DETAIL SLOPE TO DRAINAWAY FROM CONTROL BUILDING

GENERAL NOTES

- FOUNDATIONS OUTLINES AND DETAILS ILLUSTRATED ON THIS DRAWING ARE CONCEPTUAL ONLY AND ARE NOT RESTRICTED BEYOND THE GENERAL OUTLINE CONFIGURATION AND MINIMUM DIMENSIONS.
- FINAL FOUNDATION DESIGN SHALL BE BASED ON THE DESIGN PARAMETERS GIVEN IN THE SPECIFICATIONS.
- FOR LOCATIONS AND LENGTH OF CABLE TRENCHES SEE GENERAL SUBSTATION LAYOUT DRAWINGS.

CONCRETE NOTES

- CONCRETE SHALL HAVE A 28 DAY MINIMUM COMPRESSIVE DESIGN STRENGTH OF 210kg/cm².
- ALL REINFORCING BARS SHALL BE DEFORMED NEW BILLET STEEL BAR CONFORMING TO ASTM A615 GRADE 60.
- REINFORCING STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH MANUAL OF STANDARD PRACTICE OF THE CONCRETE REINFORCING STEEL INSTITUTE.
- MINIMUM COVER FOR REINFORCING STEEL SHALL BE
 - CONCRETE CAST AGAINST EARTH 75mm
 - ALL OTHER CONCRETE 50mm
- CONCRETE FOUNDATIONS SHALL HAVE THE FOLLOWING MINIMUM STEEL
 - FOUNDATION PIERS-0.003 GROSS AREA
 - FOUNDATION FOOTINGS-0.003 AVERAGE GROSS AREA
- ALL EXPOSED CONCRETE SHALL HAVE 20x20mm CHAMFER EDGES.

Rev.	Date	Description	Approved

NEPAL ELECTRICITY AUTHORITY
(GoN Undertaking)

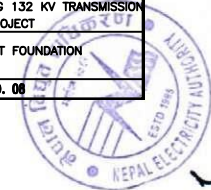
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT

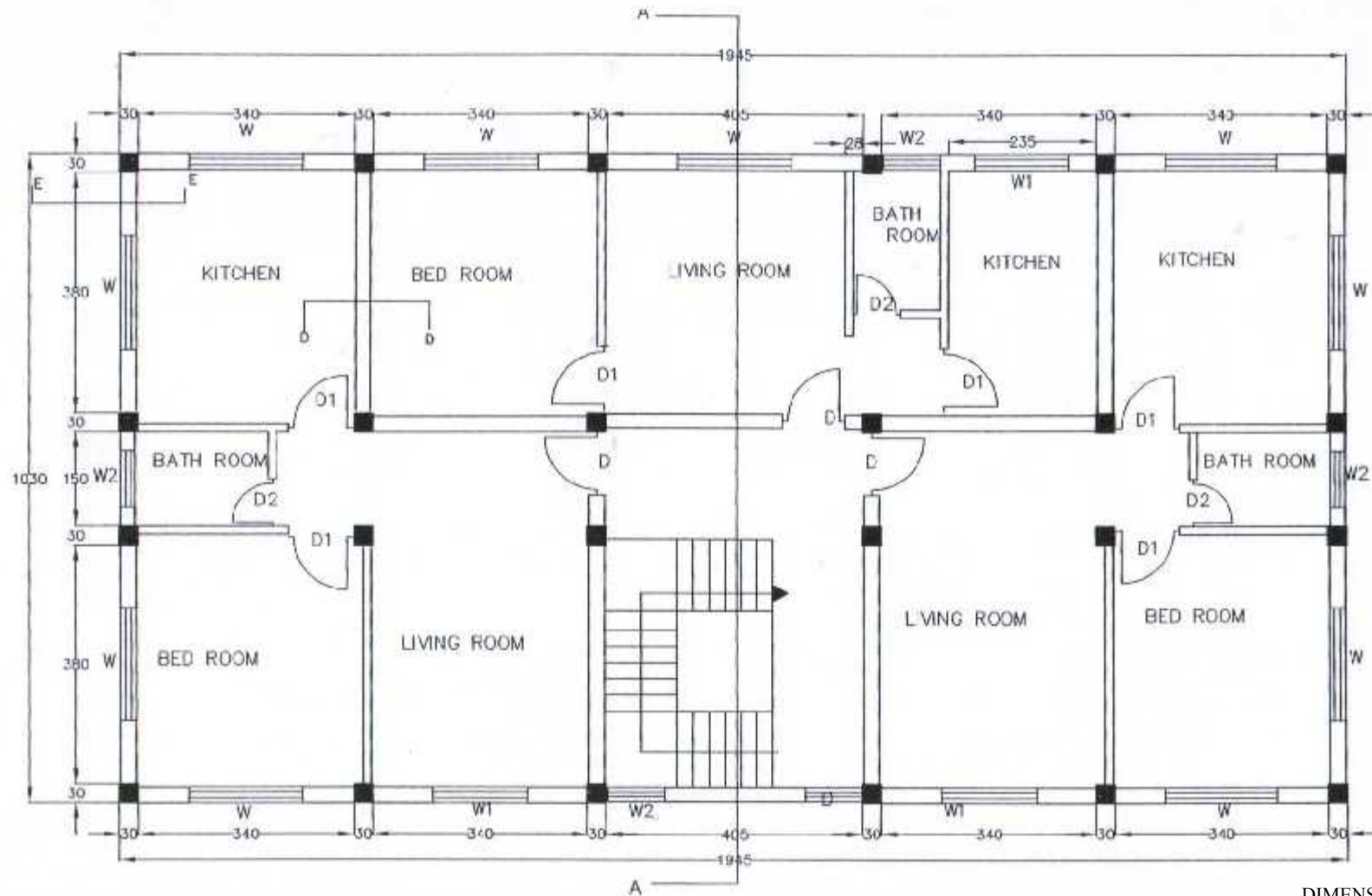
BURTIBANG PAUDI-AMARAI TAMGHAS
SANDHIKHARKA GORUSHING 132 KV TRANSMISSION
LINE PROJECT

Title
TYPICAL EQUIPMENT FOUNDATION

DWG. NO. 06


For Tender Purpose only

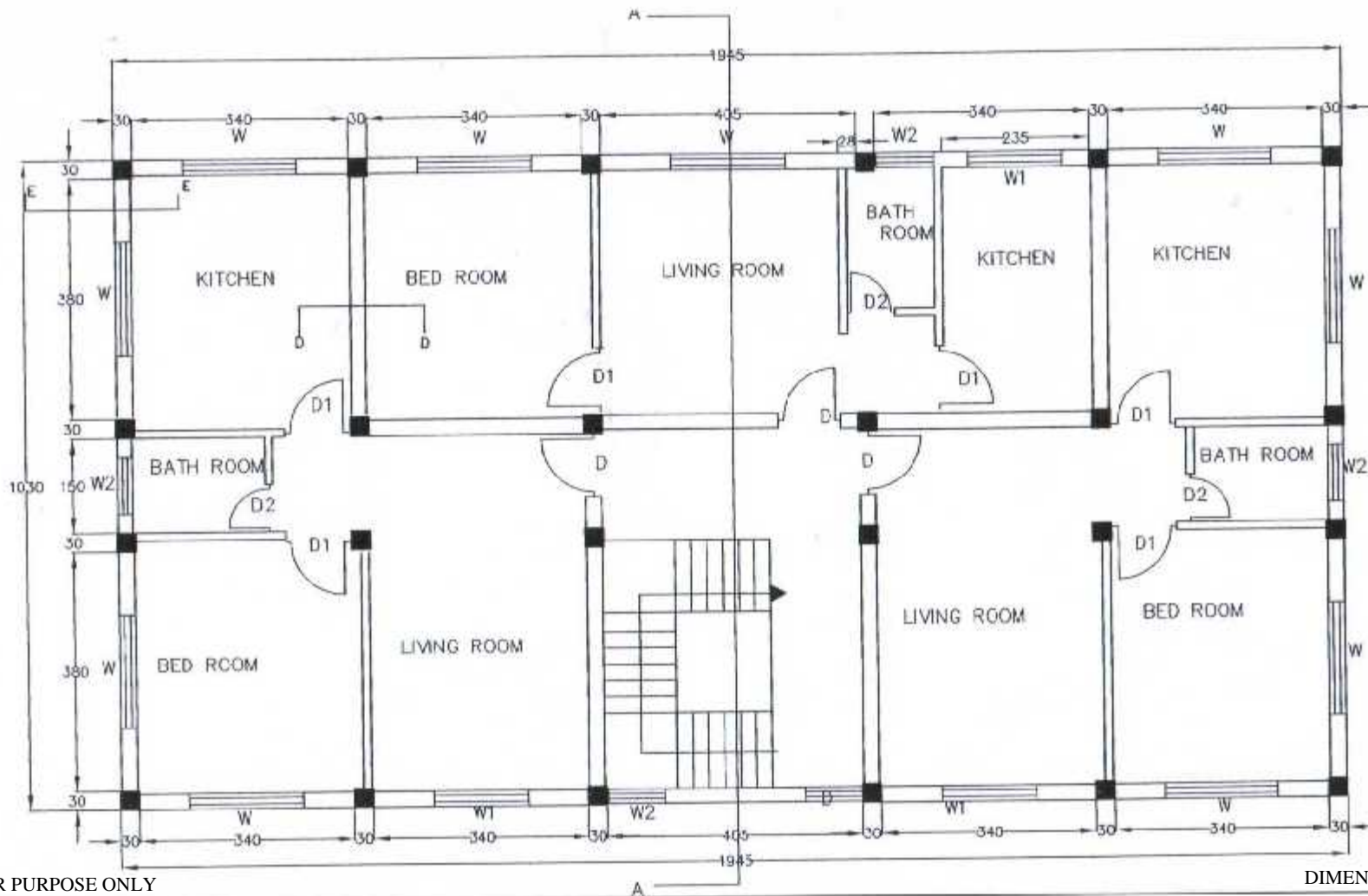




FOR TENDER PURPOSE ONLY

DIMENSIONS IN CM

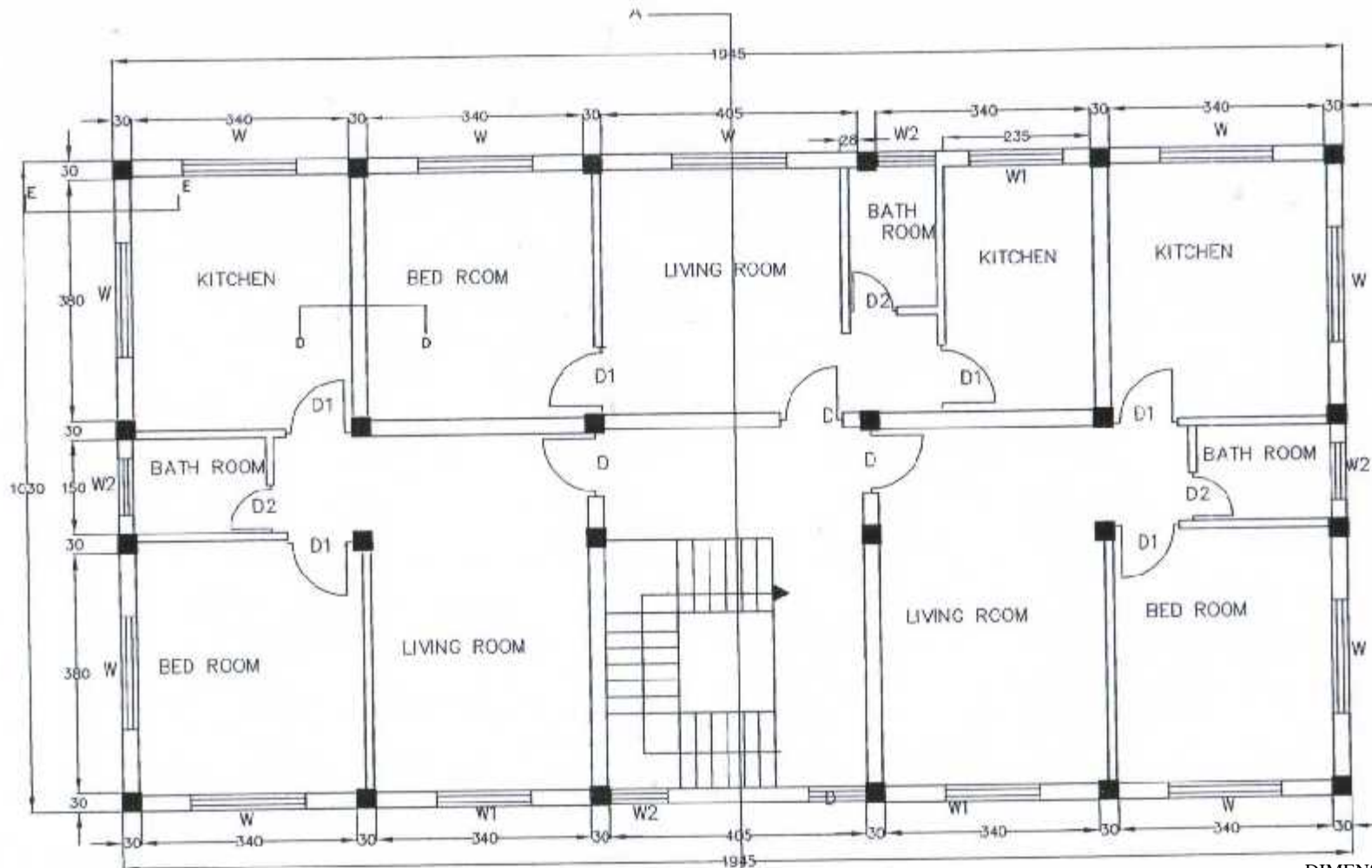
<p>NEPAL ELECTRICITY AUTHORITY GRID DEVELOPMENT DEPARTMENT Bartibang-Poudham-arabi-Tamghas-Sandhikharka-Gorusingha 132 kV Transmission Line Project</p>	<p>STAFF QUARTER AT MOTIPUR SUBSTATION & SANDHIKARKA SUBSTATION</p>	<p>TITLE: Typical Plan of First Floor</p>	<p>DRAWN BY: </p>	<p>CHECKED BY:</p>	<p>APPROVED BY:</p>	<p>DRAWING NO. :- SCALE: Not in Scale</p>
---	--	---	---	--------------------	---------------------	--



FOR TENDER PURPOSE ONLY


DIMENSIONS IN CM

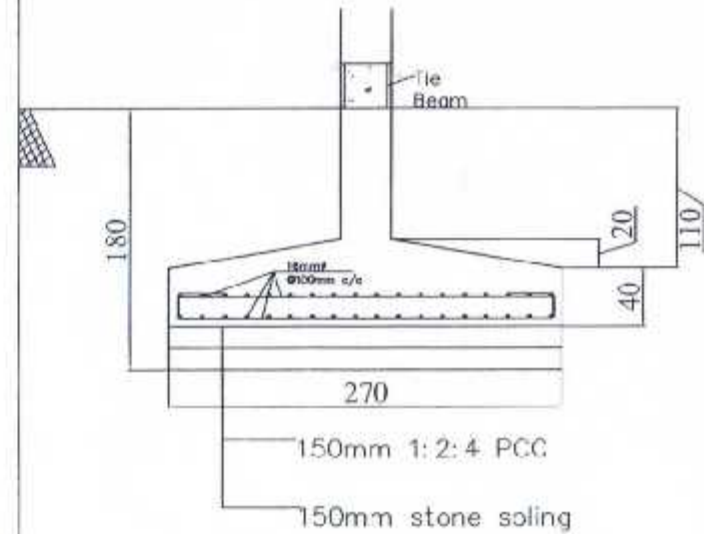
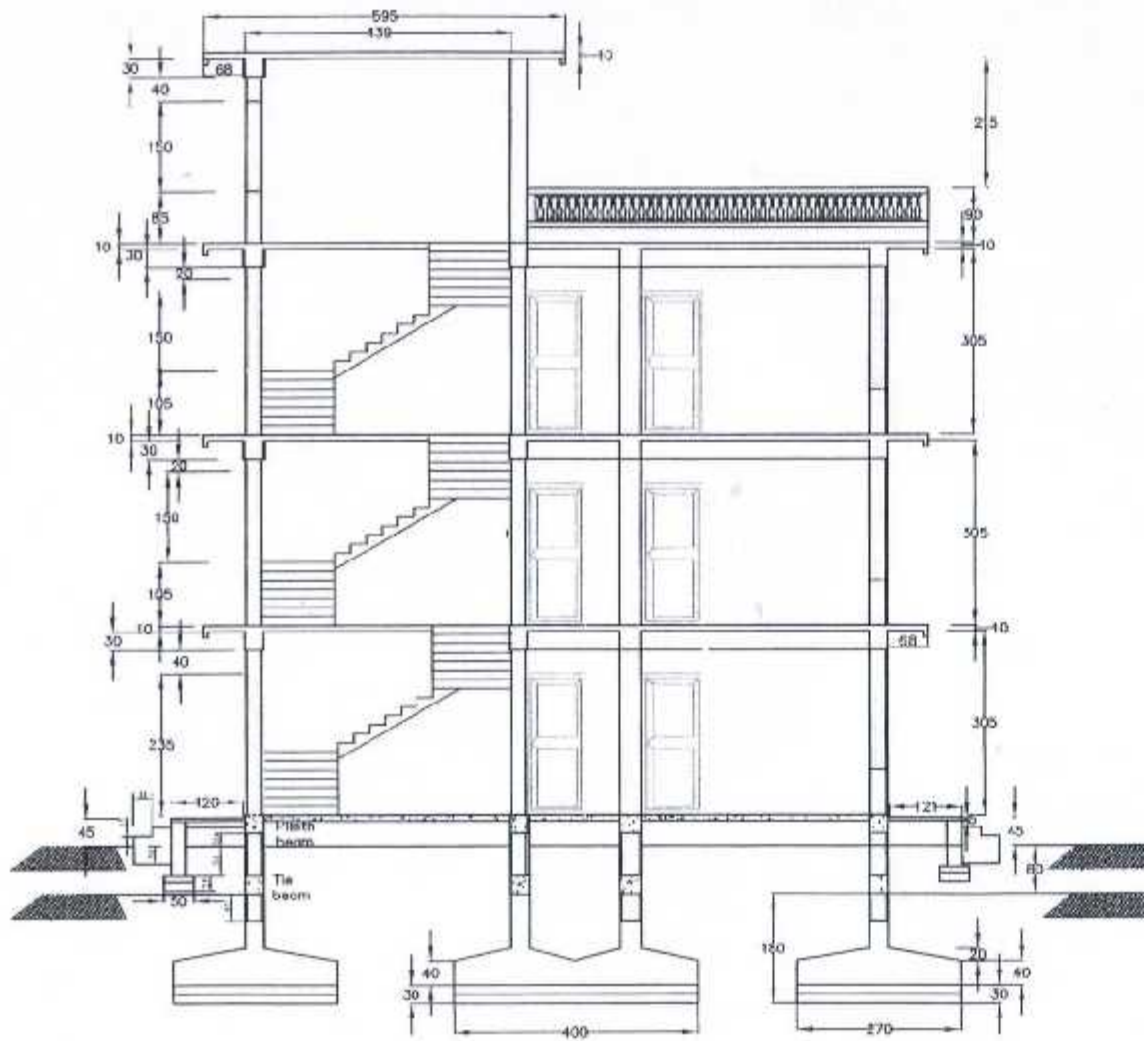
<p>NEPAL ELECTRICITY AUTHORITY GRID DEVELOPMENT DEPARTMENT Butibas-Bardhamaraha-Tamghas-Sanchukarka-Gorusinghe 1.52 kV Transmission Line Project</p>	<p>STAFF QUARTER AT MOTIPUR SUBSTATION & SANDHIKARKA SUBSTATION</p>	<p>TITLE: Typical Plan of Second Floor</p>	<p>DRAWN BY: </p>	<p>CHECKED BY:</p>	<p>APPROVED BY:</p>	<p>DRAWING NO. :-</p> <hr/> <p>SCALE: Not in Scale</p>
--	--	--	--	---------------------------	----------------------------	--



FOR TENDER PURPOSE ONLY

DIMENSIONS IN CM


<p>NEPAL ELECTRICITY AUTHORITY GRID DEVELOPMENT DEPARTMENT Burtibang-Paudamirahi-Tamghas-Sandhikharka-Gorasinghe 132 kV Transmission Line Project</p>	<p>STAFF QUARTER AT MOTIPUR SUBSTATION & SANDHIKHARKA SUBSTATION</p>	<p>TITLE: Typical Plan of Third Floor</p>	<p>DRAWN BY: </p>	<p>CHECKED BY:</p>	<p>APPROVED BY:</p>	<p>DRAWING NO. - SCALE: Not in Scale</p>
--	---	--	---	--------------------	---------------------	---

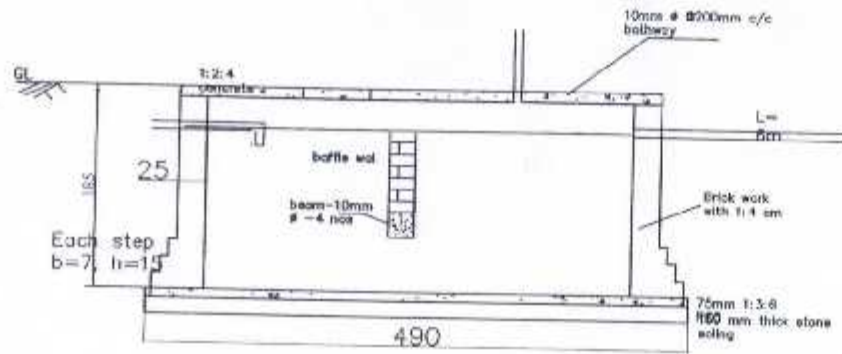


SECTION AT A-A

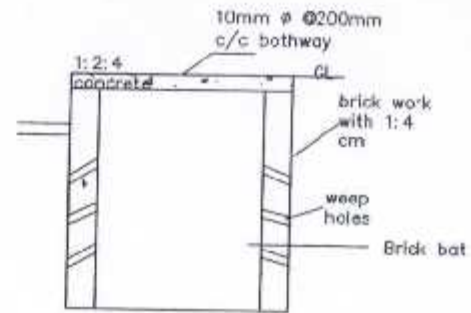
DIMENSIONS IN CM

FOR TENDER PURPOSE ONLY

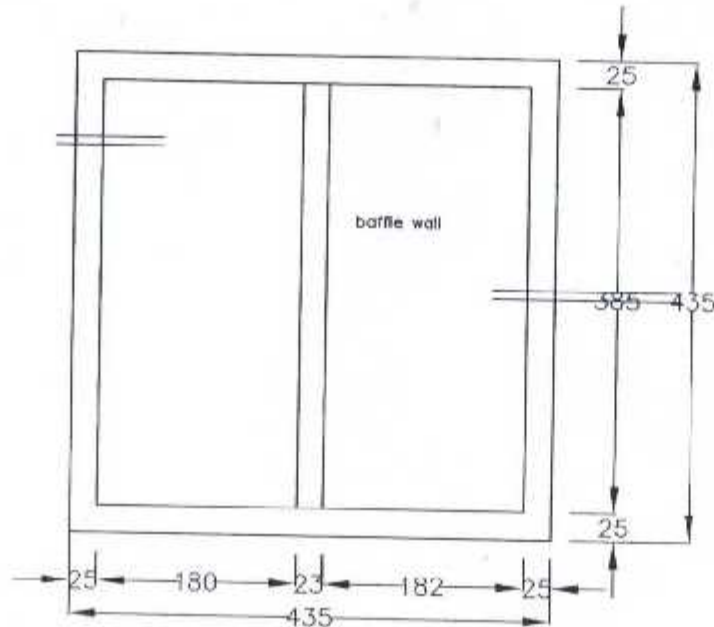
NEPAL ELECTRICITY AUTHORITY GRID DEVELOPMENT DEPARTMENT Birtibang-Paudisaraha-Tamghas-Sardhukha/Gomasinghe 132 kV Transmission Line Project	STAFF QUARTER AT MOTIPUR SUBSTATION & SANDHIKARKA SUBSTATION	TITLE: Section	DRAWN BY: 	CHECKED BY:	APPROVED BY:	DRAWING NO. >
						SCALE: Not in Scale



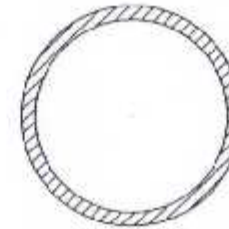
SECTIONAL VIEW OF SEPTIC TANK



CIRCULAR SOAKPIT



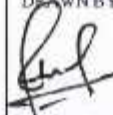
PLAN OF SEPTIC TANK

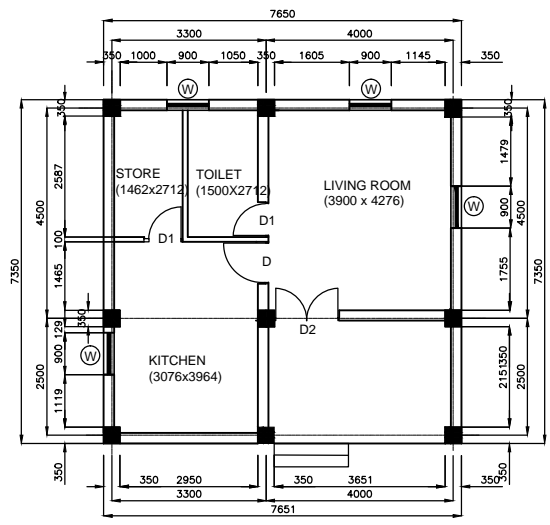


Diameter 2m
PLAN OF SOAKPIT

FOR TENDER PURPOSE ONLY

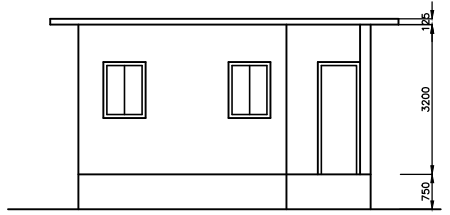
DIMENSIONS IN CM

NEPAL ELECTRICITY AUTHORITY GRID DEVELOPMENT DEPARTMENT Birtbang-Paandamarahi-Tamghas-Sandhikharka-Gorungthe 132 kV Transmission Line Project	STAFF QUARTER AT MOTIPUR SUBSTATION & SANDHIKHARKA SUBSTATION	TITLE: Septic Tank	DRAWN BY: 	CHECKED BY:	APPROVED BY:	DRAWING NO. 0
						SCALE: Not in Scale



PLAN GUARD HOUSE


OPENING SCHEDULE			
SN	DESCRIPTION	NO.	SIZE
1	D1	2	750*100
2	D	1	900*225
3	D2	1	1387*225
6	W	4	900*225



ELEVATION GUARD HOUSE



Rev.	Date	Description	Approved


NEPAL ELECTRICITY AUTHORITY
 (GoN Undertaking)

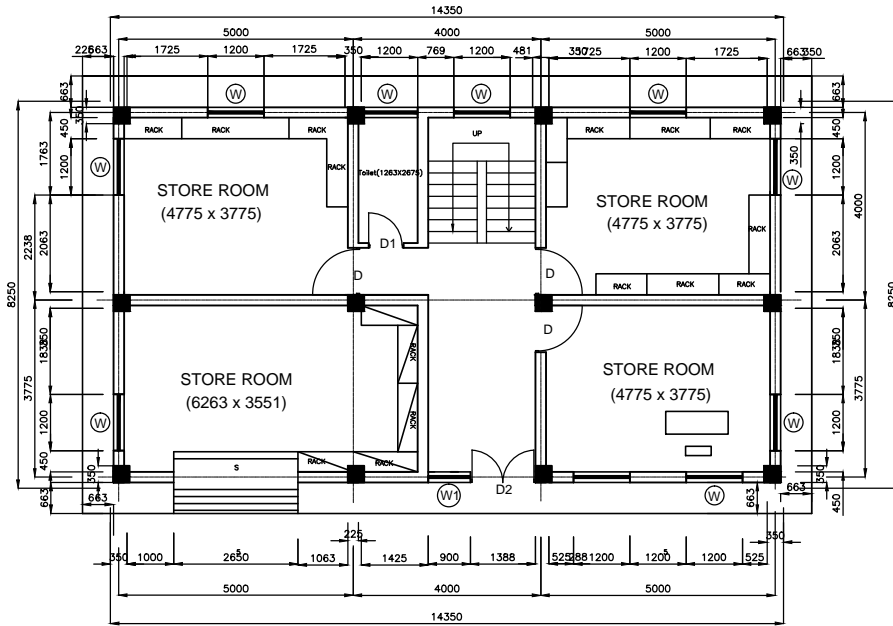
TRANSMISSION DIRECTORATE
 GRID DEVELOPMENT DEPARTMENT

BURTIBANG-PAUDI AMRAI-TAMGASH-
 SANDHIKHARAK-GORUSINGE
 132KV TRANSMISSION LINE PROJECT

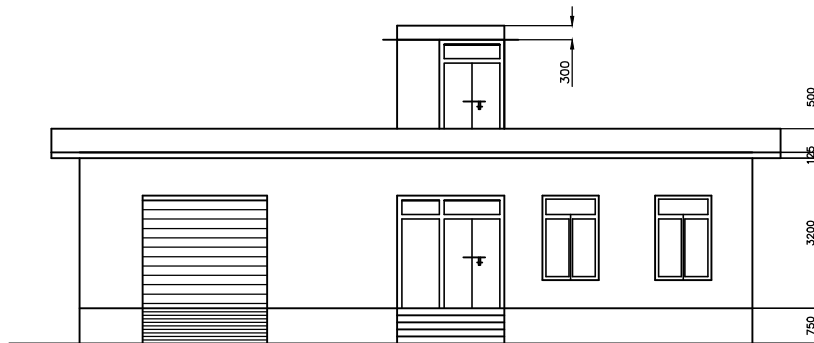
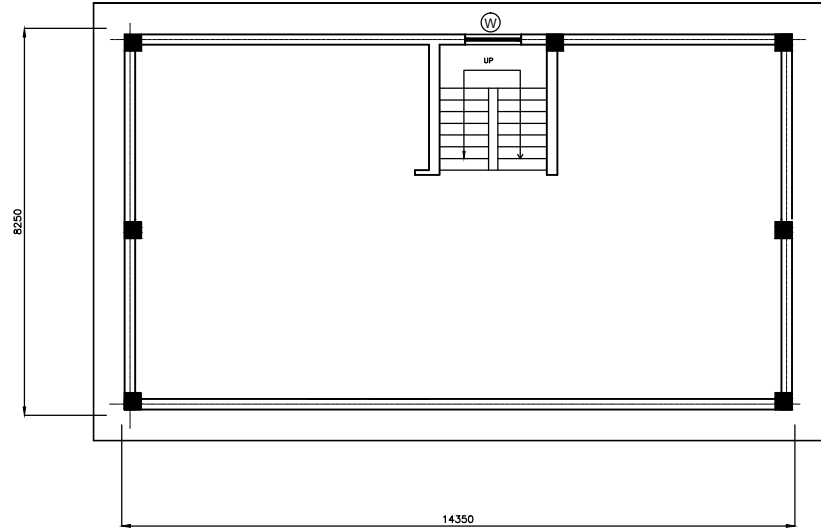
Title
 MOTIPUR & SANDHIKHARAK SUB-STATION
 GUARD HOUSE

Dwg. No.: 128





PLAN STORE BUILDING




ELEVATION STORE BUILDING

OPENING SCHEDULE			
SN	DESCRIPTION	NO.	SIZE
1	W	10	1200*225
2	W1	1	900*225
3	D	3	1000*225
4	D1	1	750*225
5	D2	1	1387*225
6	S	1	2850*225

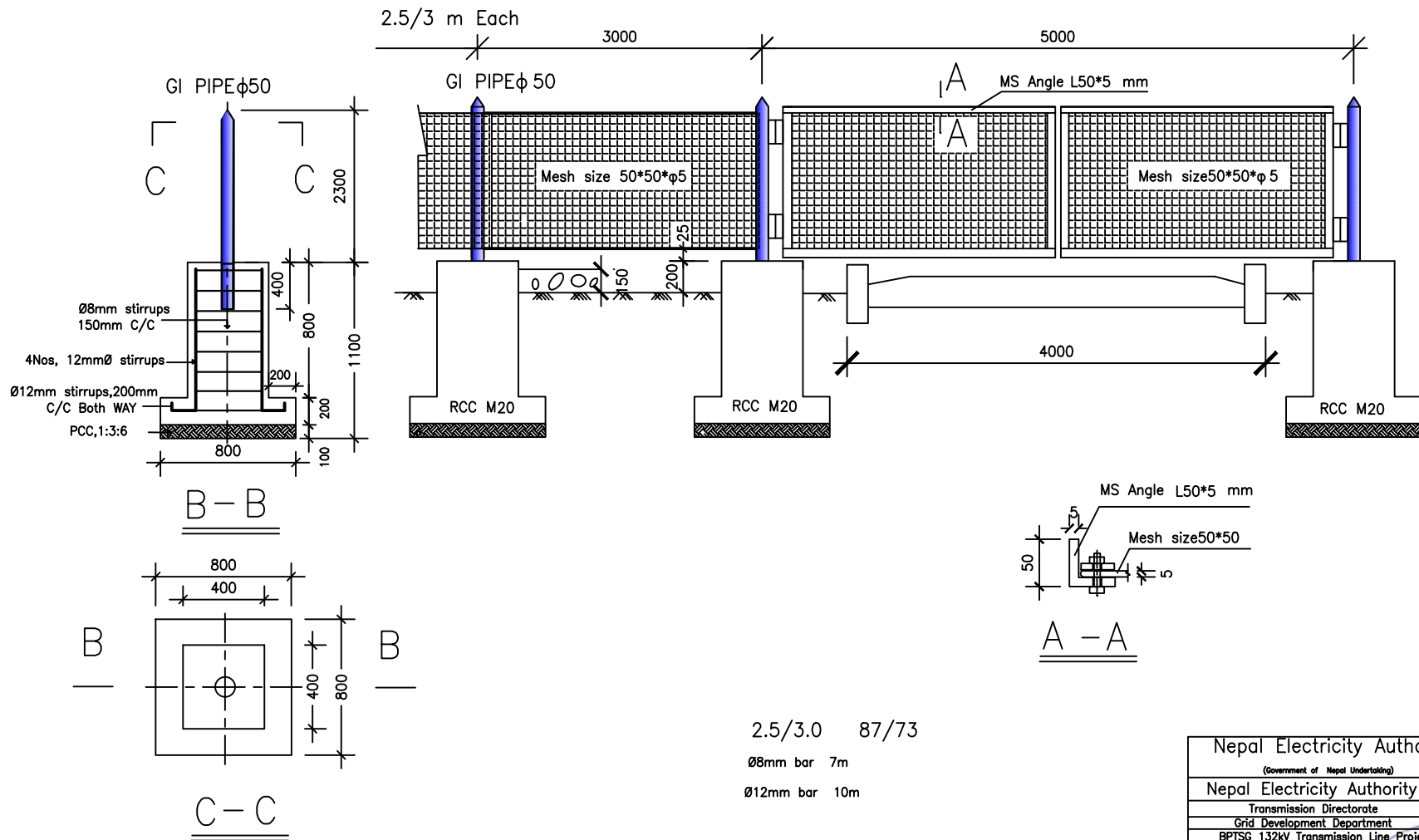


Rev.	Date	Description	Approved


NEPAL ELECTRICITY AUTHORITY
 (GoN Undertaking)
 TRANSMISSION DIRECTORATE
 GRID DEVELOPMENT DEPARTMENT
 BURTIBANG-PAUDI AMRAI-TAMGASH-
 SANDHIKHARAK-GORUSINGE
 132KV TRANSMISSION LINE PROJECT
 Title
 MOTIPUR & SANDHIKHARAK SUB-STATION
 STORE BUILDING
 Dwg. No.: 129



Handwritten signature



2.5/3.0 87/73

$\phi 8$ mm bar 7m

$\phi 12$ mm bar 10m

Nepal Electricity Authority	
(Government of Nepal Undertaking)	
Nepal Electricity Authority	
Transmission Directorate	
Grid Development Department	
BPTSG 132kV Transmission Line Project	
132kV Motipur & Sandhikharka Substation	
DESCRIPTION	Switchyard French Gate
DESIGNED BY	APPROVED BY
CHKD. BY	
DRAWING NO. C0101-3	SCALE 1:100



Handwritten signature