

NEPAL ELECTRICITY AUTHORITY

(An Undertaking of Government of Nepal)
Project Management Directorate



SASEC: Power System Expansion Project MARSYANGDI KATHMANDU 220kV T/L PROJECT

BIDDING DOCUMENT FOR

Procurement of Plant for 220 kV Air Insulated Switchgear (AIS) Substation in Matatirtha, Kathmandu and 220kV Gas Insulated Switchgear (GIS) Substation in Markichowk, Marsyangdi (Design, Supply and Installation and Commissioning)

**Single-Stage, Two-Envelope
Bidding Procedure**

Issued on:	
Invitation for Bids No.:	PMD-MKTLP-072/73-03
ICB No.:	PMD-MKTLP-072/73-03
Employer:	Nepal Electricity Authority
Country:	Nepal

VOLUME –III OF III

May 2016

**Marsyangdi Kathmandu 220kV Transmission Line Project
Project Management Directorate
Matatirtha Substation, Chandragiri Municipality, Kathmandu, Nepal**

Telephone: +977-1-5164143
Fax: +977-1-5164143

Letter of Price Bid

[Bidder's Letterhead]

Date:

ICB No.:

Invitation for Bid No.:

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB) 8;
- (b) We offer to design, manufacture, test, deliver, install, precommission and commission in conformity with the Bidding Document the following Plant and Services:
..;
- (c) The total price of our Bid, excluding any discount offered in item (d) below is:or, when left blank, is the Bid Price indicated in the Summary of Bill of Quantities
- (d) Our bid shall be valid for a period of days from the date fixed for the submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (e) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document
- (f) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: **

Name of Recipient	Address	Reason	Amount
.....
.....

- (g) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
- (h) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

- (i) We agree to permit ADB or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB.

Note: The Failure to specify the total price of the bid in (c) above or the Bid Price in the Summary of Bill of Quantities shall be ground for declaring the bid nonresponsive.

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

NEPAL ELECTRICITY AUTHORITY

PROJECT MANAGEMENT DIRECTORATE

SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No.1: Plant and Equipment including Mandatory Spares to be supplied from abroad

FC: Foreign Currency

LC: Local Currency

Item No.	Item description	Country of origin	Estimated		CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal)			Total Amount (Excluding Taxes and Duties)	Custom, VAT and other taxes
			Unit	Quantity	FC			FC	LC
					Currency#	Unit Rate	Amount		
1	2	3	4	5	6	7	8 = (7) x (5)	9=8	10
I-A	Extension of 220/132/33kV Matatirtha Substation								
	Part-A : EMPLOYER ASSESSED QUANTITIES								
A1	POWER TRANSFORMER								
A1.1	POWER TRANSFORMER								
A1.1.1	1-Ph Autotransformers								
a)	53.33MVA , 220/132/33 KV, 1-phase Autotransformer (Excluding insulating oil)		Nos.	7					
b)	Insulating oil for 53.33MVA , 220/132/33 KV, 1-phase Autotransformer (* 1Lot = Oil for 1Autotransformers)		Lot*	7					
c)	33kV Current transformer (NCT) for autotransformer		No	2					
A1.2	Testing & Maintenance Equipments								
a)	Oil Storage Tank		No.	1					
b)	Transformer Oil Filtration plant (6KLPH)		No	1					
A2	LT TRANSFORMER								
1.0	630 kVA,33/0.400kV		Nos	2					
B	245 kV equipment								
1.0	245 kV Circuit Breakers (3-Phase) with support structure								

a	1600A, 40KA	Nos	7					
b	2500A, 40KA	No	1					
2.0	245kV Isolator (3-phase)-Double Break							
a	1600A, 40 KA, Isolator with one E/S	Nos	7					
b	1600A, 40 KA, Isolator with two E/s	Nos	7					
c	1600 A, 40KA, Tandem Isolator without E/S	Nos	13					
d	2500A, 40 KA, Isolator with two E/s	Nos	2					
3.0	245 kV Current Transformer (1-Phase)							
a	1600A, 40KA with 120% extended current rating	Nos	21					
b	1600 A, 40KA with 150% extended current	Nos	3					
4.0	245 kV Capacitive Voltage Transformer (1- Phase)							
a	4400 pF	Nos.	18					
5.0	216 kV Surge Arrestors (1-phase)	Nos.	19					
6.0	245 kV Bust Post Insulator (Except auxiliary buses of transformer)	Nos	40					
C	145 kV equipment							
4.0	145 kV Surge Arrestors							
a	120 kV Surge Arrestors (1- Phase)	Nos	7					
5.0	Bus post insulators (Except auxiliary buses of transformer)	Set	14					
D1	72.5kV EQUIPMENT							
1.1	72.5 kV, 1250A, 31.5kA Circuit Breaker (3-phase) with support structure	No.	1					
1.2	72.5 kV, 1250A,31.5kA Isolators with earth switch (3-phase, DBR type)	No.	1					
1.3	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.	Nos.	3					
1.4	72.5kV PT.(1-phase)	Nos.	3					
1.5	72.5 kV BPI (1-phase)	Nos.	6					
D.2	33kV Equipments							
1.1	33 kV, 630A Isolators with out earth switch (3-phase, DBR type)	No.	1					
1.2	30 kV Surge Arrestors (1-phase)	Nos.	3					
1.3	36 kV BPI	Nos.	3					

1.4	36 kV HG Fuse along with support insulator (1-phase)		Nos.	3					
E	RELAY PANELS (WITH AUTOMATION)								
1.0	220 kV								
a	Circuit Breaker Relay Panel								
i	With Auto Reclose		Set	5					
ii	With out Auto Reclose		Set	3					
b	Line Protection Panel (Matatirtha -Marsyangdi)		Set	2					
c	Line Protection Panel (Matatirtha –Trishuli)		Set	2					
d	Current Differential Relay for other end of line (Upper Trishuli 3A Line)		Nos	2					
e	Transformer Protection Panel (For both HV & MV side)		Set	2					
f	Bus Bar Protection Panel		Set	1					
F	COMMON EQUIPMENTS								
1.0	Relay Testing Tool kit		Set	1					
2.0	Time synchronisation equipment		No.	1					
G	SUBSTATION AUTOMATION								
G.1	Complete Substation Automation System (SAS) for substation including hardware and software for the substation & remote control stations alongwith associated equipments for the following bays as per Technical Specification								
a	Main bays to be automated								
i	220 kV system		Bay Nos	8					
ii	Bays to be automated of existing 132 kV substation		Bay Nos	10					
iii	Bays to be automated of existing 33 kV substation		Bay Nos	8					
iv)	Bays to be automated of existing 11 kV substation		Bay Nos	11					
v)	BCU for controlling & monitoring of Auxilary System		Set	1					
H	Teleprotection & communication Equipments								
a	Digital Protection Coupler		Nos	6					
h	PABX with following configuration as per TS		Set	1					
i)	2 wire subscriber interface card with capacity 32 local subscribers (along with 32 nos. Instruments)								
ii)	4 wire E & M interface card with capacity 8 nos. trunks (For PLCC)								
iii)	E-1 interface with 2 trunks G-703								
iv)	2 wire interface with 1 trunk (For PSTN)								

i	Testing & Maintenance equipment (print test kit only)	Set	1					
j	4 wire telephone equipment	No	1					
I	LT Switchgear (As per Technical specification)							
a	415V Main switchboard	Set	1					
b	415V ACDB	Set	1					
c	415V MLDB	Set	1					
d	415V Emergency LDB	Set	1					
e	220V DCDB	Sets	2					
J	Batteries							
a	220V							
i	600 AH	Nos	2					
K	Float Cum Boost Battery Charger							
a	220V Float Cum Boost Battery Charger							
i	80A/80A	Nos	2					
L	Diesel Generator with control Panel							
a	100 KVA	Set	1					
M	Fire Protection System							
a	Portable /Trolley/Wheel mounted extinguishers							
i	9 litre water type	Nos	5					
ii	50 litre foam type	Nos	2					
iii	4.5 kg CO ₂ type	Nos	13					
iv	4.5 kg Dry Chemical Power (DCP) type	Nos	5					
b	Smoke detection system	Set	1					
c	Fire detection and Alarm System	Set	1					
N	Cables along with clamps, glands, lugs and straight joints etc.							
b	Power Cables - (1.1kV grade)							
i	3.5Cx300 sqmm (XLPE) cable for filter Machine along with termination arrangement as per TS	KM	1					
O	Air conditioning System for Control room cum administrative building							
a	High wall type split AC unit of 2 TR capacity	Nos	20					
p	Fabrication, galvanising and supply of following Steel Structures including nuts, bolts, all types of washers, packplates, step bolts and gusset plates including foundation bolts.							
(a)	Lattice Structure including Foundation Bolts	MT	426					

(b)	Pipe Structure including Foundation Bolts .		MT	35					
(c)	Fastners and step bolts.(Nuts,Bolts & Washers)		MT	18					
Q	Communication equipments for Matatirha Substation								
1	Transmission Equipment								
(i)	SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)								
(a)	Base Equipment (Common cards, Cross-connect/control cards, Optical base cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (ii) and (iii) below)		No.	1					
(ii)	Optical Interface/SFP# for								
(a)	S1.1		Nos.	4					
(b)	S1.1 **		Nos.	2					
(c)	L4.2		Nos.	2					
(iii)	Tributary Cards								
i	E1 Interface card (Minimum 16 interfaces per card)		Nos.	1					
ii	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)		No.	2					
2	Termination Equipment								
A1	Drop/Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)		Nos.	1					
A2	Subscriber Line Interface Cards								
(a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)		Nos.	1					
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)		Nos.	1					
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)		Nos.	1					
(d)	Synchronous data card (NX64kbps)		No.	1					
3	Equipment Cabinets								
(a)	For Drop/Insert Multiplexer		No.	1					
(b)	For SDH Equipment		No.	1					
4	TMN – Craft Terminal for SDH & PDH Equipments								
(a)	Hardware		Set*	1					
(b)	Software		Set*	1					

5	Main Distribution Frame(100 pairs)		No.	1					
6	BOQ for Auxiliary Power Supply Equipments								
(i)	SMPS based 48V DC Power Supply (DCPS) system		Nos.	1					
(ii)	VRLA type Battery bank for above DCPS system		Nos.	1					
	Note# :Optical interface/SFP can be provided with Optical base card or Control card with the condition that control card shall not be equipped with more than one Optical interface/SFP and optical card with not more than two Optical interface/SFP. However main and protection channel shall be terminated on separate cards								
	Note*: Set shall include all required hardware/software for complete TMN –Craft Terminal system as specified in technical specifications.								
	Note** : Consider for existing equipment installed at Matatitha (Existing) and Optical Interface Card(s)/SFP shall be suitable to integrate with equipment installed Matatirtha (Existing).								
	Sub-Total Part-A								
	Part-B: CONTRACTOR ASSESSED QUANTITIES								
A	Erection Hardware								
	Insulator strings, Disc Insulators, Hardware, conductor, Al tube, bus-bar materials, cable trays, Bay MB, clamps, spacers, connectors including equipment connectors, Junction box, earthwire, buried cable trenches/pipe equipment & lighting, all accessories etc. for the following:								
a	220 kV Layout (DMT Layout)								
i	Line Bay		Set	4					
ii	Transformer Bay		Set	2					
iii	TBC Bay		Set	1					
iv	BC bay		Set	1					
v	Bus work (Three Bays)		Set	3					
b	For spare unit of 220/132/36 kV auto transformer connection through auxiliary buses, Neutral formation and delta formation (for two banks): Required 245 kV BPI for HV auxiliary bus, 132 kV BPI for 132 kV Auxiliary bus, 72.5 kV BPI for tertiary auxiliary bus & delta formation, 36 kV BPI for Neutral formation & Neutral auxiliary bus including Al tube, bus-bar materials, clamps, spacers, connectors, including equipment connectors, support structures, Earthing of spare unit as per technical specification.		Set	1					

c	Erection Hardware etc for 72.5kV equipments & LT Transformer connection	Set	1					
A1	Connection of 132 kV side of Transformer on exiting 132kV Bays							
i	132 kV cable (with Copper conductor) of suitable current rating along with cable termination kit (both end i.e. Transformer 132 kV end and 132 bay end) for 132 kV side of Transformer connection on exiting 132kV Bays connection as per specification for	Set	2					
A2	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect (but excluding LM structures for Lightning protection)							
i	Earth Conductor (copper)	LS	1					
ii	Earth Rod (copper clad steel)	LS	1					
iii	Equipment for lightning protection	LS	1					
B	Fire Protection System							
a	Pumping arrangement for HVW system & hydrant system, complete with all piping, valves, fittings, etc. inside pump house							
i	220/132kV (New) Substation	Set	1					
b	Hydrant system, complete U/G piping and accessories etc. outside the Pump House.							
i	220/132kV (New) Substation	Set	1					
c	HVW spray system, Hydrant system and complete U/G & O/G piping and accessories etc. outside the pump house for Transformer :							
c.1	Transformer							
i	53.33MVA , 220/132/33 KV, 1-phase Autotransformer	Sets	7					
C	Illumination System							
a	Fire fighting building illumination	LS	1					
b	Illumination System for switchyard panel room							
i	220KV	Sets	4					
c	Control room cum administrative building illumination	LS	1					
d	Switchyard lighting	LS	1					
e	Street lighting	LS	1					
f	Township quarter (B-Type, 4 nos)	LS	1					
g	Township quarter (C-Type, 4 nos)	LS	1					
h	Security room	LS	1					
i	Car parkings	LS	1					
D	Air conditioning System							
a	Air conditioning for S/Y panel room							
i	220KV	Sets	4					

E	POWER & CONTROL CABLES								
a	Power Cables(PVC)- (1.1kV grade)	LS	1						
b	Power Cables (XLPE)(excluding 3.5Cx300 sqmm (XLPE) cable for filter Machine- (1.1kV grade)	LS	1						
c	Control Cable (PVC)- (1.1kV grade)	LS	1						
d	Cable glands, lugs & straight through joints for Power & Control cables	LS	1						
F	Integration of all 220/132/33kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1						
	Sub-Total Part-B								
	Part-C: Mandatory Spares								
(I)	Mandatory Spare List for Autotransformer								
	For 53.33MVA , 220/132/33 KV, 1-phase Autotransformer								
a)	Bushing of each rating with metal parts & gaskets and lifting tools	Set	1						
b)	Cooler fan with Motor	No.	1						
c)	Buchholz Relay(Main Tank) complete with floats and contacts	Set	1						
d)	Local and Remote WTI with sensing device and contact(each)	Set	1						
e)	Magnetic oil level gauge	No.	1						
f)	Strarters, contactors,switches & Relays for Electrical control panels(One ste of each type)	Set	1						
g)	Remote Tap postion Indiactor	No.	1						
h)	Spare insulating oil to be handed over to Owner after commisioning for O&M requirement	KL	10						
(II)	245kV CB								
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for 2500A, 40 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						

vi)	Molecular filter		Nos.	2					
vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)		Set	1					
viii)	Pressure switches / Density monitor (1 no. of each type)		Set	1					
ix)	Auxiliary switch assembly (for one pole of CB)		Set	1					
(III) 72.5kV CB									
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for 1250A, 31.5 KA (No. of Pole)		No.	1					
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)		Set	1					
iii)	Trip coils with resistor		Nos.	2					
iv)	Closing coils with resistor		Nos.	1					
v)	Terminal Pads & connectors		Nos.	2					
vi)	Molecular filter		Nos.	2					
vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)		Set	1					
viii)	Pressure switches / Density monitor (1 no. of each type)		Set	1					
ix)	Auxiliary switch assembly (for one pole of CB)		Set	1					
(IV) 245kV Isolator									
i)	One complete pole including support Insulator, motor operating mechanism (MOM) with box but excluding structure 1600A, 40 KA, 1 E/S (no. of pole)		No.	1					
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)		Set	2					
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)		Set	1					
iv)	Limit Switch		Nos.	2					
v)	Terminal Pads & Connectors		Nos.	3					
vi)	Corona shield rings		Nos.	3					
(V) 72.5 kV Isolator									
i)	One complete pole including support Insulator, MANUAL operating mechanism with box but excluding structure 1250A, 31.5KA, 1 E/S (no. of pole)		No.	1					
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)		Set	2					
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)		Set	1					
iv)	Limit Switch		Nos.	2					
v)	Terminal Pads & Connectors		Nos.	3					
(VI) 36kV Isolator									

i)	One complete pole including support Insulator, MANUAL operating mechanism with box but excluding structure 630A, 25KA, 1 E/S (no. of pole)	No.	1					
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)	Set	2					
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)	Set	1					
iv)	Limit Switch	Nos.	2					
v)	Terminal Pads & Connectors	Nos.	3					
(VII) 245kV CT								
i	1600A, 40KA with 120% extended current rating	No.	1					
ii	1600 A, 40KA with 150% extended current rating	No.	1					
(VIII)	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.	No.	1					
(IX)	CVT (245 kV,4400 pF)	No.	1					
(X)	72.5kV PT.(1-phase)	No.	1					
(XI) 216 SA								
i)	Complete LA	No.	1					
ii)	Surge counter/monitor	Nos.	5					
(XII) 120kV SA								
i)	Complete LA	No.	1					
ii)	Surge counter/monitor	Nos.	5					
(XIII) 30kV SA								
i)	Complete LA	No.	1					
ii)	Surge counter/monitor	Nos.	5					
(XIV) C&R PANELS								
i)	Transformer protection panel :							
a)	Transformer differential protection	No.	1					
b)	REF protection relay with non-linear resistor	No.	1					
c)	Directional over current & E/F Protection Relay	No.	1					
ii)	Line protection panel :							
a)	Distance Protection relay- Main-1	Set	1					
b)	Current differential Protection relay- Main-2	Set	1					
iv)	Breaker Relay panel:							
a)	Breaker failure relay	No.	1					
b)	Trip circuit supervision relay	Nos.	2					

c)	Self reset trip relay (relay of each type)	Set	1					
d)	Hand reset trip relay(relay of each type)	Set	1					
e)	Timer relay(relay of each type)	Set	1					
f)	DC supervision relay(relay of each type)	Set	1					
g)	Flag relays(relay of each type)	Set	1					
h)	Auxiliary relays(relay of each type)	Set	1					
(XV)	Teleprotection Equipments							
i)	Set of prints for protection coupler (digital)	Set	1					
(XVI)	SAS							
i)	Bay Control Unit (IED) of each type	Set	1					
ii)	Ethernet Switch of each type	Set	1					
(XVII)	BATTERY CHARGER(220kV)							
i)	Set of control cards	Set	1					
ii)	Set of relays	Set	1					
iii)	Rectifier transformer	No.	1					
iv)	Thyristor/diode	Set	1					
v)	Fuses of Thyristor with indicators	Set	6					
(XVIII)	COMMON SPARES							
i)	Bay unit Module	No.	1					
ii)	2 wire local subscriber interface card for PABX	No.	1					
iii)	E1 Interface card for PABX	No.	1					
(XIX)	Mandatory Spares of Communication Equipments							
1	Transmission Equipment							
A	SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)							
(i)	Common cards, Power supply cards, power cabling, other hardware & accessories (each)	Set ^{ss}	1					
(ii)	Optical Interface/SFP for							
a)	S1.1	No.	2					
b)	L4.2	No.	1					
(iii)	Tributary Cards							
a)	E1 Interface card (Minimum 16 interfaces per card)	No.	1					
b)	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	1					
2	Termination Equipment							
A1	Drop & Insert Multiplexer	Set ^{ss}	1					

	Common cards, Power supply cards, power cabling, other hardware & accessories (each)								
A2	Subscriber Line Interface Cards								
a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)	No.	1						
b)	2 wire (sub/Exch) voice channel cards (min 8 channels per card)	No.	1						
c)	4 wire (E&M) voice channel cards (min 8 channels per card)	No.	1						
d)	Asynchronous Sub Channels data cards, minimum 4 channels per card	No.	1						
e)	Synchronous data card (NX64kbps)	No.	1						
3	Pre Connectorized Optical Fiber Patch Cords (10 Mtrs) – Pack of Six Patch Cords	Set	1						
4	Mandatory Spares for DCPS								
a)	MCCB/MCB-2P/ Contactor/ Timer/ Relay of each type & rating (as applicable)	Set	1						
b)	Single Pole MCBs (for outgoing DC Feeders)	Nos.	5						
c)	Electronic Printed Circuit Board / Card of each type (all cards/module including SMPS Module, DC Power Supply Controller, various interface cards etc.)	Set	1						
	Note\$\$: One Set means one of each type of module/unit card etc								
	Sub-Total Part-C								
	Total for Extension of 220/132/33kV Matatirtha Substation(220 kV AIS) [(I-A)- (Part-A+ Part-B+ Part C)]								
I-B	Extension of 220/132/33kV Marsyangdi Substation (220 kV GIS & 132 kV AIS)								
	Part-A : EMPLOYER ASSESSED QUANTITIES								
A1	POWER TRANSFORMER								
A1.1	POWER TRANSFORMER								
a)	53.33MVA , 220/132/33 KV, 1-phase Autotransformer (Excluding insulating oil)	Nos.	4						

b)	Insulating oil for 53.33MVA , 220/132/33 KV, 1-phase Autotransformer (* 1Lot = Oil for 1Autotransformers)		Lot*	4					
c)	33kV Current transformer (NCT) for autotrasnformer		No	1					
A1.2	Testing & Maintenance Equipments								
a)	Oil Storage Tank		No.	1					
b)	Transformer Oil Filtration plant (6KLPH)		No	1					
A2	LT TRANSFORMER								
1.0	630 kVA,33/0.400kV		Nos	1					
B	245 kV equipment								
B1	420KV GIS Equipment								
1.01	245kV, SF6 GIS Bus Bars Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (a) of Section Project]		Set	2					
1.02	245kV, SF6 GIS ICT bay Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (b) of Section Project]		Set	2					
1.03	245kV, SF6 GIS Line bay Module [Module description as per Technical specification, Cl. No.2.2.2.1.1, (d) of Section Project]		Set	8					
1.04	245kV, SF6 GIS Bus Coupler bay Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (e) of Section Project]		Set	1					
1.05	245 kV Auxiliary Bus to connect spare unit of Transformer [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (c) of Section Project]		Set	1					
1.06	245kV, 1600A,40kA SF6/ Air Bushing for Connecting GIS to AIS alongwith support structure (Single Phase)		Nos	7					
1.07	245kV, 2400A,40kA SF6/ Air Bushing for Connecting GIS to AIS alongwith support structure (Single Phase)		Nos	24					

1.08	245kV, 1600A, 1phase SF6 GIS Bus duct alongwith support structure	Mtr	250					
1.09	245kV, 2400A, 1phase SF6 GIS Bus duct alongwith support structure	Mtr	950					
1.10	Testing & Maintenance Equipment for GIS							
(i)	Partial Discharge Monitoring System for 245kV GIS System as per Technical Specification, GIS	Set	1					
(ii)	Dew Point meter for 245kV GIS System	Set	1					
(iii)	SF6 Gas Leak Detector for 245kV GIS System	Set	1					
(iv)	EOT crane for 245kV GIS Hall	Set	1					
(v)	SF6 Gas Analyser	Set	1					
B2	245KV Outdoor Equipment							
1.1	216 KV Surge Arrester (1-phase)	Nos.	28					
1.2	245kV BPI	Nos.	90					
C	145 kV equipment							
1.0	145 kV Circuit Breaker (3-Phase) with support structure							
a	1250A, 31.5 kA	Nos	1					
2.0	145kV Isolator (3-phase)-HDB							
a	1250A, 31.5 KA, Isolator with one E/S	Nos	2					
c	1250 A, 31.5KA, Isolator without E/S	Nos	3					
3.0	145 kV Current Transformer (1- Phase)							
a	800A, 31.5 kA with 120% extended rating	Nos	3					
4.0	145 kV Surge Arrestors							
a	120 kV Surge Arrestors (1- Phase)	Nos	4					
5.0	145 kV Bus post insulators (Except for auxiliary buses of transformer)	Set	34					
7.0	72.5kV EQUIPMENT							
1.1	72.5 kV, 1250A, 31.5kA Circuit Breaker (3-phase) with support structure	No.	1					
1.2	72.5 kV, 1250A,31.5kA Isolators with earth switch (3-phase, DBR type)	No.	1					
1.3	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.	Nos.	3					

1.4	72.5kV PT.(1-phase)		Nos.	3				
1.5	72.5 kV BPI (1-phase)		Nos.	6				
E	RELAY PANELS (WITH AUTOMATION)							
1.0	220 kV							
a	Circuit Breaker Relay Panel							
i	With Auto Reclose		Set	8				
ii	With out Auto Reclose		Set	3				
b	Line Protection Panel		Set	8				
c	Current Differential Relay for other end of line		Nos	6				
d	Transformer Protection Panel (For both HV & MV side)		Set	1				
e	Bus Bar Protection Panel		Set	1				
2.0	132 kV							
a	Circuit Breaker Relay Panel							
ii	With out Auto Reclose		Set	1				
e	Bus Bar Protection Panel (augmentation for 1 ICT bay)		Set	1				
F	COMMON EQUIPMENTS							
1.0	Relay Test tool kit		Set	1				
2.0	Time synchronisation equipment		No.	1				
G	SUBSTATION AUTOMATION							
G.1	Complete Substation Automation System (SAS) for substation including hardware and software for the substation & remote control stations alongwith associated equipments for the following bays as per Technical Specification							
a	Main bays to be automated							
i	220 kV system		Bay Nos	11				
ii	132 kV system (Transformer bay under present scope)		Bay Nos	1				
iii	Bays to be automated of existing 132 kV substation		Bay Nos	6				
iv)	Bays to be automated of existing 33 kV substation		Bay Nos	3				
v)	BCU for controlling & monitoring of Auxilary System		Set	1				
H	Teleprotection & communication Equipments							
g(i)	Digital Protection Coupler		Nos	8				
g(ii)	Digital Protection Coupler(for other end)		Nos	6				
h	PBAX with following configuration as per TS		Set	1				

i)	2 wire subscriber interface card with capacity 32 local subscribers (along with 32 nos. Instruments)							
ii)	4 wire E & M interface card with capacity 8 nos. trunks (For PLCC)							
iii)	E-1 interface with 2 trunks G-703							
iv)	2 wire interface with 1 trunk (For PSTN)							
i	Testing & Maintenance equipment (print test kit only)	Set	1					
j	4 wire telephone equipment	No	1					
I	LT Switchgear (As per Technical specification)							
a	415V Main switchboard	Set	1					
b	415V ACDB	Set	1					
c	415V MLDB	Set	1					
d	415V Emergency LDB	Set	1					
e	220V DCDB	Sets	2					
J	Batteries							
a	220V							
i	600 AH	Nos	2					
K	Float Cum Boost Battery Charger							
a	220V Float Cum Boost Battery Charger							
i	80A/80A	Nos	2					
L	Diesel Generator with control Panel							
a	100 kVA	Set	1					
M	Fire Protection System							
a	Portable /Trolley/Wheel mounted extinguishers							
i	9 litre water type	Nos	5					
ii	50 litre foam type	Nos	2					
iii	4.5 kg CO ₂ type	Nos	13					
iv	4.5 kg Dry Chemical Power (DCP) type	Nos	5					
b	Smoke detection system	Set	1					
c	Fire detection and Alarm System	Set	1					
N	Cables along with clamps, glands, lugs and straight joints etc.							
(a)	Power Cables - (1.1kV grade)							
i	3.5Cx300 sqmm (XLPE) cable for filter Machine along with termination arrangement as per TS	KM	1					
O	Air conditioning System for Control room cum administrative building							
a	High wall type split AC unit of 2 TR capacity	Nos	25					

p	Fabrication, galvanising and supply of following Steel Structures including nuts, bolts, all types of washers, packplates, step bolts and gusset plates including foundation bolts.								
(a)	Lattice Structure including Foundation Bolts		MT	163					
(b)	Pipe Structure including Foundation Bolts .		MT	17					
(c)	Fastners and step bolts.(Nuts,Bolts & Washers)		MT	8					
Q	Communication equipments for Marsyangdi Substation								
1	Transmission equipments								
	(i) SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)								
(a)	Base Equipment (Common cards, Cross-connect/control cards, Optical base cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (ii) and (iii) below)		No.	1					
(ii)	Optical Interface/SFP[#] for								
(a)	S1.1		Nos.	4					
(b)	S1.1 **		Nos.	2					
(c)	L4.2		Nos.	2					
(iii)	Tributary Cards								
i	E1 Interface card (Minimum 16 interfaces per card)		Nos.	1					
ii	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)		No.	2					
2	Termination Equipment								
A1	Drop/Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)		Nos.	1					
A2	Subscriber Line Interface Cards								
(a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)		Nos.	1					
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)		Nos.	1					
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)		Nos.	1					
(d)	Synchronous data card (NX64kbps)		No.	1					
3	Equipment Cabinets								
(a)	For Drop/Insert Multiplexer		No.	1					
(b)	For SDH Equipment		No.	1					
4	Main Distribution Frame(100 pairs)		No.	1					
5	BOQ for Auxiliary Power Supply Equipments								
(i)	SMPS based 48V DC Power Supply (DCPS) system		Nos.	1					

(ii)	VRLA type Battery bank for above DCPS system		Nos.	1					
	At Kathmandu LDC								
1	Termination Equipment								
A1	Drop/Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)		No.	1					
A2	Subscriber Line Interface Cards								
(a)	2 wire (sub/Exch) voice channel cards (min 8 channels per card)		No.	1					
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)		No.	1					
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)		No.	1					
(d)	Synchronous data card (NX64kbps)		No.	1					
2	Equipment Cabinets								
(a)	For Drop/Insert Multiplexer		No.	1					
3	Main Distribution Frame(100 pairs)		No.	1					
	Note# :Optical interface/SFP can be provided with Optical base card or Control card with the condition that control card shall not be equipped with more than one Optical interface/SFP and optical card with not more than two Optical interface/SFP. However main and protection channel								
	Note*: Set shall include all required hardware/software for complete TMN –Craft Terminal system as specified in technical specifications.								
	Note** : Consider for existing equipment installed at Matatitha (Existing) and Optical Interface Card(s)/SFP shall be suitable to integrate with equipment installed Marsyangdi Substation (Existing).								
	Sub-Total Part-A								
	Part-B: CONTRACTOR ASSESSED QUANTITIES								
A	Erection Hardware								

	Insulator strings, Disc Insulators, Hardware, conductor, Al tube, bus-bar materials, cable trays, clamps, spacers, connectors including equipment connectors, Junction box, earthwire, buried cable trenches/pipe equipment & lighting, all accessories etc. for the following:							
a	245kV GIS Termination Arrangement:							
i	Line Bay	Set	8					
ii	Transformer Bay (including 220 kV AIS connection for spare unit with GIS auxiliary bus module)	Set	2					
b	For 132 kV (Double Main Layout)							
i	Transformer Bay	Set	1					
ii	Bus work (For four bays, excluding bus post insulators)	Set	1					
c	For spare unit of 220/132/36 kV auto transformer connection through auxiliary buses (132 kV, tertiary & Neutral auxiliary buses only), Neutral formation and delta formation (for one bank): Required 132 kV BPI for 132 kV Auxiliary bus, 72.5 kV BPI for tertiary auxiliary bus & delta formation, 36 kV BPI for Neutral formation & Neutral auxiliary bus including Al tube, bus-bar materials, clamps, spacers, connectors, including equipment connectors, support structures, Earthing of spare unit as per	Set	1					
d	Erection Hardware etc for 72.5kV equipments & LT Transformer connection	Set	1					
e	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect(but excluding LM structures for Lightning protection)							
i	Earth Conductor (copper)	LS	1					
ii	Earth Rod (copper clad steel)	LS	1					
iii	Equipment for lightning protection	LS	1					
B	Fire Protection System							
a	Pumping arrangement for HVW system & hydrant system, complete with all piping, valves, fittings,etc. inside pump house							
i	220/132kV (New) Substation	Set	1					
b	Hydrant system, complete U/G piping and accessories etc. outside the Pump House.							
i	220/132kV (New) Substation	Set	1					
c	HVW spray system, Hydrant system and complete U/G & O/G piping and accessories etc. outside the pump house for Transformer :							
c.1	Transformer							
i	53.33MVA, 220/132/33 KV, 1-phase Autotransformer	Sets	4					
C	Illumination System							
a	Control room cum administrative building illumination	LS	1					
b	Fire fighting building illumination	LS	1					
c	Switchyard lighting	LS	1					

d	Street lighting		LS	1					
e	Transit Camp illumination		LS	1					
f	245kV GIS Building including panel room		LS	1					
g	Township quarter (B-Type, 4 nos)		LS	1					
h	Township quarter (C-Type, 4 nos)		LS	1					
i	Township quarter (D-Type, 1 nos)		LS	1					
j	Car parkings		LS	1					
D	Air conditioning & ventilation System								
D.1	Air conditioning system								
(i)	Panel room in 245kV GIS Hall		LS	1					
D.2	Ventilation system								
(i)	245KV GIS hall		LS	1					
G	POWER & CONTROL CABLES								
b	Power Cables(PVC)- (1.1kV grade)		LS	1					
b	Power Cables (XLPE)(excluding 3.5Cx300 sqmm (XLPE) cable for filter Machine)- (1.1kV grade)		LS	1					
c	Control Cable (PVC)- (1.1kV grade)		LS	1					
d	Cable glands, lugs & straight through joints for Power & Control cables		LS	1					
H	Integration of all 220/132/33kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.		LS	1					
Sub-Total Part-B									
Part-C: Mandatory Spares									
(i)	Mandatory Spare List for Autotransformer								
	For 53.33MVA , 220/132/33 KV, 1-phase Autotransformer								
a)	Bushing of each rating with metal parts & gaskets and lifting tools		Set	1					
b)	Cooler fan with Motor		No.	1					
c)	Buchholz Relay(Main Tank) complete with floats and contacts		Set	1					
d)	Local and Remote WTI with sensing device and contact(each)		Set	1					
e)	Magnetic oil level gauge		No.	1					

f)	Starters, contactors, switches & Relays for Electrical control panels (One set of each type)	Set	1					
g)	Remote Tap position Indicator	No.	1					
h)	Spare insulating oil to be handed over to Owner after commissioning for O&M requirement	KL	10					
(II)	SPARES FOR 245kV GIS							
A)	General							
a.	SF6 gas Pressure Relief Devices, 1Nos. of each type	Set	1					
b.	SF6 Pressure gauge cum switch OR Density monitors and pressure switch as applicable (1 no. of each type)	Set	1					
c.	Coupling device for pressure gauge cum switch for connecting Gas handling plant	Set	1					
d.	Rubber Gaskets, "O" Rings and Seals for SF6 gas of each type	Set	1					
e.	Molecular filter for SF6 gas with filter bags (20% of total weight)	Set	1					
f.	All types of Control Valves for SF6 gas of each type	Set	1					
g.	SF6 gas (20 % of total gas quantity)	Set	1					
h.	All types of coupling for SF6 gas (1 no. of each type)	Set	1					
i.	Pipe length (Copper or Steel as applicable) for SF6 Circuit of each type	Set	1					
j.	Covers with all accessories necessary to close a compartment in case of dismantling of any part of the Enclosure to ensure the sealing of this compartment							
j.1	For 3 Phase Enclosure if applicable	Nos.	1					
j.2	For Single phase enclosure if applicable	Nos.	1					
k	Locking device to keep the Dis-connectors (Isolators) and Earthing switches in close or open position in case of removal of the driving Mechanism	Sets	1					
l	Bus Support insulator of each type for 3 phase/single phase enclosure.	Nos.	1					
m	SF6 to air bushing (245kV) as applicable	Sets	1					
B)	245 KV SF6 CIRCUIT BREAKER:							
a.	Complete Circuit Breaker pole of each type & rating complete with interrupter, main circuit enclosure and Marshalling Box with operating mechanism	Nos.	1					
b.	Rubber gaskets, 'O' rings and seals for SF6 gas (1 No. of each type)	Sets	1					
c.	Trip coil assembly with resistor as applicable	Sets	1					

d.	Closing coil assembly with resistor as applicable .	Sets	1					
e.	Relays, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	Sets	1					
f.	Closing coil assembly (including valve, if applicable)	Sets	1					
g.	Trip coil assembly (including valve, if applicable)	Sets	1					
h.	Auxiliary switch assembly of each type	Sets	1					
C)	245 KV ISOLATORS :							
a.	Complete set of 3-phase dis-connector including main circuit, enclosure, driving mechanism (one no of each type)	Sets	1					
b.	Single Phase/ 3-phase Earthing switch including main circuit, enclosure, driving mechanism.	Sets	1					
c.	Copper contact fingers for dis-connector male & female contact for one complete (3-phase) dis-connector of each type and rating	Sets	1					
d.	Copper contact fingers for earthing switch male & female contacts, for one complete(3-phase) earthing switch of each type and rating	Sets	1					
e.	Open / Close contactor assembly, timers, key interlock for one complete (3 phase) dis-connector and (3 phase) earthing switch (1 No. of each type and rating)	Sets	1					
f.	Push button switch - (1 No. of each type & rating) as applicable	Sets	1					
g.	Limit switch and Aux. Switches for complete 3 phase equipment							
g.1	For isolator	Sets	1					
g.2	For earth switch	Sets	1					
D)	245 KV CURRENT TRANSFORMER							
a.	Gas insulated complete CT of each type and rating with enclosure.	Nos.	1					
b.	Secondary bushing of each type	Sets	1					
E)	245 kV VOLTAGE TRANSFORMER							
a.	Gas insulated complete PT of each type and rating with enclosure.	Nos.	1					
(III)	SPARES FOR AIS EQUIPMENTS							
A	145kV CB							

i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for								
	1250A, 31.5 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						
vi)	Molecular filter	Nos.	2						
vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)	Set	1						
viii)	Pressure switches / Density monitor (1 no. of each type)	Set	1						
ix)	Auxiliary switch assembly (for one pole of CB)	Set	1						
(B)	72.5 kV CB								
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for								
	1250A, 31.5 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						
vi)	Molecular filter	Nos.	2						
vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)	Set	1						
viii)	Pressure switches / Density monitor (1 no. of each type)	Set	1						
ix)	Auxiliary switch assembly (for one pole of CB)	Set	1						
(C)	145kV Isolator								
i)	One complete pole including support Insulator, motor operating mechanism (MOM) with box but excluding structure								
	1250A, 31.5 KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts	Set	2						
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches	Set	1						
iv)	Limit Switch	Set	2						
v)	Terminal Pads & Connectors	Nos.	3						
(D)	72.5kV Isolator								
i)	One complete pole including support Insulator, MANUAL operating mechanism with box but excluding structure								
	1250A, 31.5KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)	Set	2						

iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)	Set	1					
iv)	Limit Switch	Nos.	2					
v)	Terminal Pads & Connectors	Nos.	3					
(E)	145kV CT							
i	800A, 31.5 kA with 120% extended rating	No.	1					
(F)	CT(72.5 kV,1250A with 120% extended current rating)	No.	1					
(G)	CVT (245 kV,4400 pF)	No.	1					
(H)	CVT (145 kV,4400 pF)	No.	1					
(I)	72.5kV PT	No.	1					
(J)	216 SA							
i)	Complete LA	No.	1					
ii)	Surge counter/monitor	Nos.	5					
(F)	120kV SA							
i)	Complete LA	No.	1					
ii)	Surge counter/monitor	Nos.	5					
(G)	C&R PANELS							
i)	Transformer protection panel :							
a)	Transformer differential protection	No.	1					
b)	REF protection relay with non-linear resistor	No.	1					
c)	Directional over current & E/F Protection Relay	No.	1					
ii)	Line protection panel :							
a)	Distance Protection relay- Main-1	No.	1					
b)	Current differential Protection relay- Main-2	No.	1					
iv)	Breaker Relay panel:							
a)	Breaker failure relay	No.	1					
b)	Trip circuit supervision relay	Nos.	2					
c)	Self reset trip relay (relay of each type)	Set	1					
d)	Hand reset trip relay(relay of each type)	Set	1					
e)	Timer relay(relay of each type)	Set	1					
f)	DC supervision relay(relay of each type)	Set	1					
g)	Flag relays(relay of each type)	Set	1					
h)	Auxiliary relays(relay of each type)	Set	1					
(H)	Teleprotection Equipments							
ii)	Set of prints for protection coupler(digital)	Set	1					
(I)	SAS							
i)	Bay Control Unit (IED) of each type	Set	1					
ii)	Ethernet Switch of each type	Set	1					

(J)	BATTERY CHARGER(220kV)								
i)	Set of control cards		Set	1					
ii)	Set of relays		Set	1					
iii)	Rectifier transformer		No.	1					
iv)	Thyristor/diode		Set	1					
v)	Fuses of Thyristor with indicators		Set	6					
(K)	COMMON SPARES								
i)	Bay unit Module		No.	1					
ii)	2 wire local subscriber interface card for PABX		No.	1					
iii)	E1 Interface card for PABX		No.	1					
	Sub-Total Part-C								
	Total For Extension of 220/132kV Marsyangdi Substation (220 kV GIS & 132 kV AIS) [(I-B)-(Part-A+ Part-B+ Part C)]								
	Total for Schedule 1 (Total of column 9 to be carried forward to Schdule 5: Grand Summary)								

Note : 1) Bidder is required to quote prices in this Schedule for all the individual items/sub-items.

2.) The Prices of equipments are inclusive of type test charges except.towers, conductors and earthwires.

- 3.) BOQ given above is indicative only based on the scope of work as given in Employer's Requirements. The quantities mentioned above may undergo change during detailed engineering to meet the
- # Specify currency in accordance with BDS ITB Clause 32.1,
Part-I of the Bidding Documents.
- * Strike-out whichever is not applicable.

Name of Bidder:
Signature of Bidder:

Date:

(Printed Name)

(Designation)

(Common Seal)

NEPAL ELECTRICITY AUTHORITY**PROJECT MANAGEMENT DIRECTORATE****SASEC Power System Expansion Project****Marsyangdi-Kathmandu 220 kV Transmission Line Project**

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No.2: Plant and Equipment including Mandatory Spares Parts to be supplied from within Nepal

LC: Local Currency (ALL Price in Local Currency)

Item No.	Item description	Unit	Quantity	Ex Factory Price (Excluding VAT) in LC		Inland transportation to site in LC		Total Amount (Excluding Taxes)	Custom, VAT and other taxes
				Unit Rate	Amount	Unit Rate	Amount		
1	2	3	4	5	6 = (4) x (5)	7	8=(4)x(7)	9=6+8	10
I-A	Extension of 220/132/33kV Matatirtha								
	Part-A : EMPLOYER ASSESSED QUANTITIES								
A1	POWER TRANSFORMER								
A1.1	POWER TRANSFORMER								
A1.1.1	1-Ph Autotransformers								
a)	53.33MVA , 220/132/33 KV, 1-phase Autotransformer (Excluding insulating oil)	Nos.	7						
b)	Insulating oil for 53.33MVA , 220/132/33 KV, 1-phase Autotransformer (* 1Lot = Oil for 1Autotransformers)	Lot*	7						
c)	33kV Current transformer (NCT) for autotransformer	No	2						
A1.2	Testing & Maintenance Equipments								
a)	Oil Storage Tank	No.	1						
b)	Transformer Oil Filtration plant (6KLPH)	No	1						
A2	LT TRANSFORMER								
1.0	630 kVA, 33/0.400kV	Nos	2						
B	245 kV equipment								
1.0	245 kV Circuit Breakers (3-Phase) with support structure								
a	1600A, 40KA	Nos	7						
b	2500A, 40KA	No	1						

2.0	245kV Isolator (3-phase)-Double Break								
a	1600A, 40 KA, Isolator with one E/S	Nos	7						
b	1600A, 40 KA, Isolator with two E/S	Nos	7						
c	1600 A, 40KA, Tandem Isolator without E/S	Nos	13						
d	2500A, 40 KA, Isolator with two E/S	Nos	2						
3.0	245 kV Current Transformer (1-Phase)								
a	1600A, 40KA with 120% extended current rating	Nos	21						
b	1600 A, 40KA with 150% extended current	Nos	3						
4.0	245 kV Capacitive Voltage Transformer (1- Phase)								
a	4400 pF	Nos.	18						
5.0	216 kV Surge Arrestors (1-phase)	Nos.	19						
6.0	245 kV Bust Post Insulator (Except auxiliary buses of transformer)	Nos	90						
C	145 kV equipment								
4.0	145 kV Surge Arrestors								
a	120 kV Surge Arrestors (1- Phase)	Nos	7						
5.0	Bus post insulators (Except auxiliary buses of transformer)	Set	14						
D1	72.5kV EQUIPMENT								
1.1	72.5 kV, 1250A, 31.5kA Circuit Breaker (3-phase) with support structure	No.	1						
1.2	72.5 kV, 1250A,31.5kA Isolators with earth switch (3-phase, DBR type)	No.	1						
1.3	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.	Nos.	3						
1.4	72.5kV PT.(1-phase)	Nos.	3						
1.5	72.5 kV BPI (1-phase)	Nos.	6						
D.2	33kV Equipments								
1.1	33 kV, 630A Isolators with out earth switch (3-phase, DBR type)	No.	1						
1.2	30 kV Surge Arrestors (1-phase)	Nos.	3						
1.3	36 kV BPI	Nos.	3						
1.4	36 kV HG Fuse along with support insulator (1-phase)	Nos.	3						

E	RELAY PANELS (WITH AUTOMATION)								
1.0	220 kV								
a	Circuit Breaker Relay Panel								
i	With Auto Reclose	Set	5						
ii	With out Auto Reclose	Set	3						
b	Line Protection Panel (Matatirtha -Marsyangdi)	Set	2						
c	Line Protection Panel (Matatirtha –Trishuli)	Set	2						
d	Current Differential Relay for other end of line (Upper Trishuli 3A Line)	Nos	2						
e	Transformer Protection Panel (For both HV & MV side)	Set	2						
f	Bus Bar Protection Panel	Set	1						
F	COMMON EQUIPMENTS								
1.0	Relay Test Tool kit	Set	1						
2.0	Time synchronisation equipment	No.	1						
G	SUBSTATION AUTOMATION								
G.1	Complete Substation Automation System (SAS) for substation including hardware and software for the substation & remote control stations alongwith associated equipments for the following bays as per Technical Specification								
a	Main bays to be automated								
i	220 kV system	Bay Nos	8						
ii	Bays to be automated of existing 132 kV substation	Bay Nos	10						
iii	Bays to be automated of existing 33 kV substation	Bay Nos	8						
iv)	Bays to be automated of existing 11 kV substation	Bay Nos	11						
v)	BCU for controlling & monitoring of Auxilary System	Set	1						
H	Teleprotection & communication Equipments								
a	Digital Protection Coupler	Nos	6						
h	PABX with following configuration as per TS	Set	1						
i)	2 wire subscriber interface card with capacity 32 local subscribers (along with 32 nos. Instruments)								
ii)	4 wire E & M interface card with capacity 8 nos. trunks (For PLCC)								
iii)	E-1 interface with 2 trunks G-703								
iv)	2 wire interface with 1 trunk (For PSTN)								
i	Testing & Maintenance equipment (print test kit only)	Set	1						
j	4 wire telephone equipment	No	1						

I	LT Switchgear (As per Technical specification)								
a	415V Main switchboard	Set	1						
b	415V ACDB	Set	1						
c	415V MLDB	Set	1						
d	415V Emergency LDB	Set	1						
e	220V DCDB	Sets	2						
J	Batteries								
a	220V								
i	600 AH	Nos	2						
K	Float Cum Boost Battery Charger								
a	220V Float Cum Boost Battery Charger								
i	80A/80A	Nos	2						
L	Diesel Generator with control Panel								
a	100 KVA	Set	1						
M	Fire Protection System								
a	Portable /Trolley/Wheel mounted extinguishers								
i	9 litre water type	Nos	5						
ii	50 litre foam type	Nos	2						
iii	4.5 kg CO ₂ type	Nos	13						
iv	4.5 kg Dry Chemical Power (DCP) type	Nos	5						
b	Smoke detection system	Set	1						
c	Fire detection and Alarm System	Set	1						
N	Cables along with clamps, glands, lugs and straight joints etc.								
b	Power Cables - (1.1kV grade)								
i	3.5Cx300 sqmm (XLPE) cable for filter Machine along with termination arrangement as per TS	KM	1						
O	Air conditioning System for Control room cum administrative building								
a	High wall type split AC unit of 2 TR capacity	Nos	20						
P	Fabrication, galvanising and supply of following Steel Structures including nuts, bolts, all types of washers, packplates, step bolts and gusset plates including foundation bolts.								
(a)	Lattice Structure including Foundation Bolts	MT	426						
(b)	Pipe Structure including Foundation Bolts .	MT	35						
(c)	Fastners and step bolts.(Nuts,Bolts & Washers)	MT	18						

Q	Communication equipments for Matatirha Substation								
1	Transmission Equipment								
	(i) SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)								
(a)	Base Equipment (Common cards, Cross-connect/control cards, Optical base cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (ii) and (iii) below)	No.	1						
	(ii) Optical Interface/SFP# for								
(a)	S1.1	Nos.	4						
(b)	S1.1 **	Nos.	2						
(c)	L4.2	Nos.	2						
	(iii) Tributary Cards								
i	E1 Interface card (Minimum 16 interfaces per card)	Nos.	1						
ii	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	2						
2	Termination Equipment								
A1	Drop/Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)	Nos.	1						
A2	Subscriber Line Interface Cards								
(a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)	Nos.	1						
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)	Nos.	1						
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)	Nos.	1						
(d)	Synchronous data card (NX64kbps)	No.	1						
3	Equipment Cabinets								
(a)	For Drop/Insert Multiplexer	No.	1						
(b)	For SDH Equipment	No.	1						
4	TMN – Craft Terminal for SDH & PDH Equipments								
(a)	Hardware	Set*	1						
(b)	Software	Set*	1						
5	Main Distribution Frame(100 pairs)	No.	1						

6	BOQ for Auxiliary Power Supply Equipments								
(i)	SMPS based 48V DC Power Supply (DCPS) system	Nos.	1						
(ii)	VRLA type Battery bank for above DCPS system	Nos.	1						
	Note# :Optical interface/SFP can be provided with Optical base card or Control card with the condition that control card shall not be equipped with more than one Optical interface/SFP and optical card with not more than two Optical interface/SFP. However main and protection channel shall be terminated on separate cards								
	Note*: Set shall include all required hardware/software for complete TMN –Craft Terminal system as specified in technical specifications.								
	Note** : Consider for existing equipment installed at Matatitha (Existing) and Optical Interface Card(s)/SFP shall be suitable to integrate with equipment installed Matatirtha (Existing).								
	Sub-Total Part-A								
	Part-B: CONTRACTOR ASSESSED QUANTITIES								
A	Erection Hardware								
	Insulator strings, Disc Insulators, Hardware, conductor, Al tube, bus-bar materials, cable trays, Bay MB, clamps, spacers, connectors including equipment connectors, Junction box, earthwire, buried cable trenches/pipe equipment & lighting, all accessories etc. for the following:								
a	220 kV Layout (DMT Layout)								
i	Line Bay	Set	4						
ii	Transformer Bay	Set	2						
iii	TBC Bay	Set	1						
iv	BC bay	Set	1						
v	Bus work (Three Bays)	Set	3						
b	For spare unit of 220/132/36 kV auto transformer connection through auxiliary buses, Neutral formation and delta formation (for two banks): Required 245 kV BPI for HV auxiliary bus, 132 kV BPI for 132 kV Auxiliary bus, 72.5 kV BPI for tertiary auxiliary bus & delta formation, 36 kV BPI for Neutral formation & Neutral auxiliary bus including Al tube, bus-bar materials, clamps, spacers, connectors, including equipment connectors, support structures, Earthing of spare unit as per technical specification.	Set	1						
c	Erection Hardware etc for 72.5kV equipments & LT Transformer connection	Set	1						

A1	Connection of 132 kV side of Transformer on exiting 132kV Bays								
i	132 kV cable (with Copper conductor) of suitable current rating along with cable termination kit (both end i.e. Transformer 132 kV end and 132 bay end) for 132 kV side of Transformer connection on exiting 132kV Bays connection as per specification for	Set	2						
A2	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect (but excluding LM structures for Lightning protection)								
i	Earth Conductor (copper)	LS	1						
ii	Earth Rod (copper clad steel)	LS	1						
iii	Equipment for lightning protection	LS	1						
B	Fire Protection System								
a	Pumping arrangement for HVW system & hydrant system, complete with all piping, valves, fittings, etc. inside pump house								
i	220/132kV (New) Substation	Set	1						
b	Hydrant system, complete U/G piping and accessories etc. outside the Pump House.								
i	220/132kV (New) Substation	Set	1						
c	HVW spray system, Hydrant system and complete U/G & O/G piping and accessories etc. outside the pump house for Transformer :								
c.1	Transformer								
i	53.33MVA , 220/132/33 KV, 1-phase Autotransformer	Sets	7						
C	Illumination System								
a	Fire fighting building illumination	LS	1						
b	Illumination System for switchyard panel room								
i	220KV	Sets	4						
c	Control room cum administrative building illumination	LS	1						
d	Switchyard lighting	LS	1						
e	Street lighting	LS	1						
f	Township quarter (B-Type, 4 nos)	LS	1						
g	Township quarter (C-Type, 4 nos)	LS	1						
h	Security room	LS	1						
i	Car parkings	LS	1						
D	Air conditioning System								
a	Air conditioning for S/Y panel room								
i	220KV	Sets	4						

E	POWER & CONTROL CABLES								
a	Power Cables(PVC)- (1.1kV grade)	LS	1						
b	Power Cables (XLPE)(excluding 3.5Cx300 sqmm (XLPE) cable for filter Machine- (1.1kV grade)	LS	1						
c	Control Cable (PVC)- (1.1kV grade)	LS	1						
d	Cable glands, lugs & straight through joints for Power & Control cables	LS	1						
F	Integration of all 220/132/33kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.		LS	1					
	Sub-Total Part-B								
	Part-C: Mandatory Spares								
(I)	Mandatory Spare List for Autotransformer								
	For 53.33MVA , 220/132/33 KV, 1-phase Autotransformer								
a)	Bushing of each rating with metal parts & gaskets and lifting tools	Set	1						
b)	Cooler fan with Motor	No.	1						
c)	Buchholz Relay(Main Tank) complete with floats and contacts	Set	1						
d)	Local and Remote WTI with sensing device and contact(each)	Set	1						
e)	Magnetic oil level gauge	No.	1						
f)	Strarters, contactors,switches & Relays for Electrical control panels(One ste of each type)	Set	1						
g)	Remote Tap postion Indiactor	No.	1						
h)	Spare insulating oil to be handed over to Owner after commisioning for O&M requirement	KL	10						
(II)	245kV CB								
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for 2500A, 40 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						
vi)	Molecular filter	Nos.	2						

vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)	Set	1						
viii)	Pressure switches / Density monitor (1 no. of each type)	Set	1						
ix)	Auxiliary switch assembly (for one pole of CB)	Set	1						
(III)	72.5kV CB								
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for								
	1250A, 31.5 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						
vi)	Molecular filter	Nos.	2						
vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)	Set	1						
viii)	Pressure switches / Density monitor (1 no. of each type)	Set	1						
ix)	Auxiliary switch assembly (for one pole of CB)	Set	1						
(IV)	245kV Isolator								
i)	One complete pole including support Insulator, motor operating mechanism (MOM) with box but excluding structure								
	1600A, 40 KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)	Set	2						
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)	Set	1						
iv)	Limit Switch	Nos.	2						
v)	Terminal Pads & Connectors	Nos.	3						
vi)	Corona shield rings	Nos.	3						
(V)	72.5 kV Isolator								
i)	One complete pole including support Insulator, MANUAL operating mechanism with box but excluding structure								
	1250A, 31.5KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)	Set	2						
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)	Set	1						
iv)	Limit Switch	Nos.	2						
v)	Terminal Pads & Connectors	Nos.	3						
(VI)	36kV Isolator								
i)	One complete pole including support Insulator, MANUAL operating mechanism with box but excluding structure								

	630A, 25KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)	Set	2						
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)	Set	1						
iv)	Limit Switch	Nos.	2						
v)	Terminal Pads & Connectors	Nos.	3						
(VII)	245kV CT								
i	1600A, 40KA with 120% extended current rating	No.	1						
ii	1600 A, 40KA with 150% extended current rating	No.	1						
(VIII)	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.	No.	1						
(IX)	CVT (245 kV,4400 pF)	No.	1						
(X)	72.5kV PT.(1-phase)	No.	1						
(XI)	216 SA								
i)	Complete LA	No.	1						
ii)	Surge counter/monitor	Nos.	5						
(XII)	120kV SA								
i)	Complete LA	No.	1						
ii)	Surge counter/monitor	Nos.	5						
(XIII)	30kV SA								
i)	Complete LA	No.	1						
ii)	Surge counter/monitor	Nos.	5						
(XIV)	C&R PANELS								
i)	Transformer protection panel :								
a)	Transformer differential protection	No.	1						
b)	REF protection relay with non-linear resistor	No.	1						
c)	Directional over current & E/F Protection Relay	No.	1						
ii)	Line protection panel :								
a)	Distance Protection relay- Main-1	Set	1						
b)	Current differential Protection relay- Main-2	Set	1						
iv)	Breaker Relay panel:								
a)	Breaker failure relay	No.	1						
b)	Trip circuit supervision relay	Nos.	2						
c)	Self reset trip relay (relay of each type)	Set	1						

d)	Hand reset trip relay(relay of each type)	Set	1						
e)	Timer relay(relay of each type)	Set	1						
f)	DC supervision relay(relay of each type)	Set	1						
g)	Flag relays(relay of each type)	Set	1						
h)	Auxiliary relays(relay of each type)	Set	1						
(XV)	Teleprotection Equipments								
i)	Set of prints for protection coupler (digital)	Set	1						
(XVI)	SAS								
i)	Bay Control Unit (IED) of each type	Set	1						
ii)	Ethernet Switch of each type	Set	1						
(XVII)	BATTERY CHARGER(220kV)								
i)	Set of control cards	Set	1						
ii)	Set of relays	Set	1						
iii)	Rectifier transformer	No.	1						
iv)	Thyristor/diode	Set	1						
v)	Fuses of Thyristor with indicators	Set	6						
(XVIII)	COMMON SPARES								
i)	Bay unit Module	No.	1						
ii)	2 wire local subscriber interface card for PABX	No.	1						
iii)	E1 Interface card for PABX	No.	1						
(XIX)	Mandatory Spares of Communication Equipments								
1	Transmission Equipment								
A	SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)								
(i)	Common cards, Power supply cards, power cabling, other hardware & accessories (each)	Set ^{ss}	1						
(ii)	Optical Interface/SFP for								
a)	S1.1	No.	2						
b)	L4.2	No.	1						
(iii)	Tributary Cards								
(a)	E1 Interface card (Minimum 16 interfaces per card)	No.	1						
(b)	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	1						
2	Termination Equipment								
A1	Drop & Insert Multiplexer hardware & accessories (each)	Set ^{ss}	1						
A2	Subscriber Line Interface Cards								

a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)	No.	1						
b)	2 wire (sub/Exch) voice channel cards (min 8 channels per card)	No.	1						
c)	4 wire (E&M) voice channel cards (min 8 channels per card)	No.	1						
d)	Asynchronous Sub Channels data cards, minimum 4 channels per card	No.	1						
e)	Synchronous data card (NX64kbps)	No.	1						
3	Pre Connectorized Optical Fiber Patch Cords (10 Mtrs) – Pack of Six Patch Cords	Set	1						
4	Mandatory Spares for DCPS								
a)	MCCB/MCB-2P/ Contactor/ Timer/ Relay of each type & rating (as applicable)	Set	1						
b)	Single Pole MCBs (for outgoing DC Feeders)	Nos.	5						
c)	Electronic Printed Circuit Board / Card of each type (all cards/module including SMPS Module, DC Power Supply Controller, various interface cards etc.)	Set	1						
	Note\$\$: One Set means one of each type of module/unit card etc								
	Sub-Total Part-C								
	Total for Extension of 220/132/33kV Matatirha Substation (220 kV AIS) [(I-A) - (Part-A+ Part-B+ Part C)]								
I-B	Extension of 220/132/33kV Marsyangdi Substation (220 kV GIS & 132 kV AIS)								
	Part-A : EMPLOYER ASSESSED QUANTITIES								
A1	POWER TRANSFORMER								
A1.1	POWER TRANSFORMER								
a)	53.33MVA , 220/132/33 KV, 1-phase Autotransformer (Excluding insulating oil)	Nos.	4						
b)	Insulating oil for 53.33MVA , 220/132/33 KV, 1-phase Autotransformer (* 1Lot = Oil for 1Autotransformers)	Lot*	4						
c)	33kV Current transformer (NCT) for autotransformer	No	1						

A1.2	Testing & Maintenance Equipments								
a)	Oil Storage Tank	No.	1						
b)	Transformer Oil Filtration plant (6KLPH)	No	1						
A2	LT TRANSFORMER								
1.0	630 kVA, 33/0.400kV	Nos	1						
B	245 kV equipment								
B1	420KV GIS Equipment								
1.01	245kV, SF6 GIS Bus Bars Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (a) of Section Project]	Set	2						
1.02	245kV, SF6 GIS ICT bay Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (b) of Section Project]	Set	2						
1.03	245kV, SF6 GIS Line bay Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (d) of Section Project]	Set	8						
1.04	245kV, SF6 GIS Bus Coupler bay Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (e) of Section Project]	Set	1						
1.05	245 kV Auxiliary Bus to connect spare unit of Transformer [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (c) of Section Project]	Set	1						
1.06	245kV, 1600A, 40kA SF6/ Air Bushing for Connecting GIS to AIS alongwith support structure (Single Phase)	Nos	7						
1.07	245kV, 2400A, 40kA SF6/ Air Bushing for Connecting GIS to AIS alongwith support structure (Single Phase)	Nos	24						
1.08	245kV, 1600A, 1phase SF6 GIS Bus duct alongwith support structure	Mtr	250						

1.09	245kV, 2400A, 1phase SF6 GIS Bus duct alongwith support structure	Mtr	950						
1.10	Testing & Maintenance Equipment for GIS								
(i)	Partial Discharge Monitoring System for 245kV GIS System as per Technical Specification, GIS	Set	1						
(ii)	Dew Point meter for 245kV GIS System	Set	1						
(iii)	SF6 Gas Leak Detector for 245kV GIS System	Set	1						
(iv)	EOT crane for 245kV GIS Hall	Set	1						
(v)	SF6 Gas Analyser	Set	1						
B2	245KV Outdoor Equipment								
1.1	216 KV Surge Arrester (1-phase)	Nos.	28						
1.2	245kV BPI	Nos.	40						
C	145 kV equipment								
1.0	145 kV Circuit Breaker (3-Phase) with support structure								
a	1250A, 31.5 kA	Nos	1						
2.0	145kV Isolator (3-phase)-HDB								
a	1250A, 31.5 KA, Isolator with one E/S	Nos	2						
c	1250 A, 31.5KA, Isolator without E/S	Nos	3						
3.0	145 kV Current Transformer (1- Phase)								
a	800A, 31.5 kA with 120% extended rating	Nos	3						
4.0	145 kV Surge Arrestors								
a	120 kV Surge Arrestors (1- Phase)	Nos	4						
5.0	145 kV Bus post insulators (Except for auxiliary buses of transformer)	Set	34						
7.0	72.5kV EQUIPMENT								
1.1	72.5 kV, 1250A, 31.5kA Circuit Breaker (3-phase) with support structure	No.	1						
1.2	72.5 kV, 1250A,31.5kA Isolators with earth switch (3-phase, DBR type)	No.	1						
1.3	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.	Nos.	3						
1.4	72.5kV PT.(1-phase)	Nos.	3						
1.5	72.5 kV BPI (1-phase)	Nos.	6						
E	RELAY PANELS (WITH AUTOMATION)								

1.0	220 kV								
a	Circuit Breaker Relay Panel								
i	With Auto Reclose	Set	8						
ii	With out Auto Reclose	Set	3						
b	Line Protection Panel	Set	8						
c	Current Differential Relay for other end of line	Nos	6						
d	Transformer Protection Panel (For both HV & MV side)	Set	1						
e	Bus Bar Protection Panel	Set	1						
2.0	132 kV								
a	Circuit Breaker Relay Panel								
ii	With out Auto Reclose	Set	1						
e	Bus Bar Protection Panel (augmentation for 1 ICT bay)	Set	1						
F	COMMON EQUIPMENTS								
1.0	Relay Test tool kit	Set	1						
2.0	Time synchronisation equipment	No.	1						
G	SUBSTATION AUTOMATION								
G.1	Complete Substation Automation System (SAS) for substation including hardware and software for the substation & remote control stations alongwith associated equipments for the following bays as per Technical Specification								
a	Main bays to be automated								
i	220 kV system	Bay Nos	11						
ii	132 kV system (Transformer bay under present scope)	Bay Nos	1						
iii	Bays to be automated of existing 132 kV substation	Bay Nos	6						
iv)	Bays to be automated of existing 33 kV substation	Bay Nos	3						
v)	BCU for controlling & monitoring of Auxilary System	Set	1						
H	Teleprotection & communication Equipments								
g(i)	Digital Protection Coupler	Nos	8						
g(ii)	Digital Protection Coupler(for other end)	Nos	6						
h	PBAX with following configuration as per TS	Set	1						
i)	2 wire subscriber interface card with capacity 32 local subscribers (along with 32 nos. Instruments)								
ii)	4 wire E & M interface card with capacity 8 nos. trunks (For PLCC)								
iii)	E-1 interface with 2 trunks G-703								
iv)	2 wire interface with 1 trunk (For PSTN)								

i	Testing & Maintenance equipment (print test kit only)	Set	1						
j	4 wire telephone equipment	No	1						
I	LT Switchgear (As per Technical specification)								
a	415V Main switchboard	Set	1						
b	415V ACDB	Set	1						
c	415V MLDB	Set	1						
d	415V Emergency LDB	Set	1						
e	220V DCDB	Sets	2						
J	Batteries								
a	220V								
i	600 AH	Nos	2						
K	Float Cum Boost Battery Charger								
a	220V Float Cum Boost Battery Charger								
i	80A/80A	Nos	2						
L	Diesel Generator with control Panel								
a	100 kVA	Set	1						
M	Fire Protection System								
a	Portable /Trolley/Wheel mounted extinguishers								
i	9 litre water type	Nos	5						
ii	50 litre foam type	Nos	2						
iii	4.5 kg CO ₂ type	Nos	13						
iv	4.5 kg Dry Chemical Power (DCP) type	Nos	5						
b	Smoke detection system	Set	1						
c	Fire detection and Alarm System	Set	1						
N	Cables along with clamps, glands, lugs and straight joints etc.								
(a)	Power Cables - (1.1kV grade)								
i	3.5Cx300 sqmm (XLPE) cable for filter Machine along with termination arrangement as per TS	KM	1						
O	Air conditioning System for Control room cum administrative building								
a	High wall type split AC unit of 2 TR capacity	Nos	25						
p	Fabrication, galvanising and supply of following Steel Structures including nuts, bolts, all types of washers, packplates, step bolts and gusset plates including foundation bolts.								
(a)	Lattice Structure including Foundation Bolts	MT	163						

(b)	Pipe Structure including Foundation Bolts .	MT	17						
(c)	Fastners and step bolts.(Nuts,Bolts & Washers)	MT	8						
Q	Communication equipments for Marsyangdi Substation								
1	Transmission equipments								
	(i) SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)								
(a)	Base Equipment (Common cards, Cross-connect/control cards, Optical base cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (ii) and (iii) below)	No.	1						
(ii)	Optical Interface/SFP# for								
(a)	S1.1	Nos.	4						
(b)	S1.1 **	Nos.	2						
(c)	L4.2	Nos.	2						
(iii)	Tributary Cards								
i	E1 Interface card (Minimum 16 interfaces per card)	Nos.	1						
ii	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	2						
2	Termination Equipment								
A1	Drop/Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)	Nos.	1						
A2	Subscriber Line Interface Cards								
(a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)	Nos.	1						
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)	Nos.	1						
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)	Nos.	1						
(d)	Synchronous data card (NX64kbps)	No.	1						
3	Equipment Cabinets								
(a)	For Drop/Insert Multiplexer	No.	1						
(b)	For SDH Equipment	No.	1						
4	Main Distribution Frame(100 pairs)	No.	1						
5	BOQ for Auxiliary Power Supply Equipments								
(i)	SMPS based 48V DC Power Supply (DCPS) system	Nos.	1						
(ii)	VRLA type Battery bank for above DCPS system	Nos.	1						
	At Kathmandu LDC								

1	Termination Equipment								
A1	Drop/Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)	No.	1						
A2	Subscriber Line Interface Cards								
(a)	2 wire (sub/Exch) voice channel cards (min 8 channels per card)	No.	1						
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)	No.	1						
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)	No.	1						
(d)	Synchronous data card (NX64kbps)	No.	1						
2	Equipment Cabinets								
(a)	For Drop/Insert Multiplexer	No.	1						
3	Main Distribution Frame(100 pairs)	No.	1						
	base card or Control card with the condition that control card shall not be equipped with more than one Optical interface/SFP and optical card with not more than two Optical interface/SFP. However main and protection channel shall be terminated on separate cards								
	Note*: Set shall include all required hardware/software for complete TMN –Craft Terminal system as specified in technical specifications.								
	Note** : Consider for existing equipment installed at Matatitha (Existing) and Optical Interface Card(s)/SFP shall be suitable to integrate with equipment installed Marsyangdi Substation (Existing).								
	Sub-Total Part-A								
	Part-B: CONTRACTOR ASSESSED QUANTITIES								
A	Erection Hardware								
	Insulator strings, Disc Insulators, Hardware, conductor, Al tube, bus-bar materials, cable trays, clamps, spacers, connectors including equipment connectors, Junction box, earthwire, buried cable trenches/pipe equipment & lighting, all accessories etc. for the following:								
a	245kV GIS Termination Arrangement:								
i	Line Bay	Set	8						
ii	Transformer Bay (including 220 kV AIS connection for spare unit with GIS auxiliary bus module)	Set	2						

b	For 132 kV (Double Main Layout)								
i	Transformer Bay	Set	1						
ii	Bus work (For four bays, excluding bus post insulators)	Set	1						
c	For spare unit of 220/132/36 kV auto transformer connection through auxiliary buses (132 kV, tertiary & Neutral auxiliary buses only), Neutral formation and delta formation (for one bank): Required 132 kV BPI for 132 kV Auxiliary bus, 72.5 kV BPI for tertiary auxiliary bus & delta formation, 36 kV BPI for Neutral formation & Neutral auxiliary bus including Al tube, bus-bar materials, clamps, spacers, connectors, including equipment connectors, support structures, Earthing of spare unit as per technical specification.	Set	1						
d	Erection Hardware etc for 72.5kV equipments & LT Transformer connection	Set	1						
e	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect(but excluding LM structures for Lightning protection)								
i	Earth Conductor (copper)	LS	1						
ii	Earth Rod (copper clad steel)	LS	1						
iii	Equipment for lightning protection	LS	1						
B	Fire Protection System								
a	Pumping arrangement for HVW system & hydrant system, complete with all piping, valves, fittings,etc. inside pump house								
i	220/132kV (New) Substation	Set	1						
b	Hydrant system, complete U/G piping and accessories etc. outside the Pump House.								
i	220/132kV (New) Substation	Set	1						
c	HVW spray system, Hydrant system and complete U/G & O/G piping and accessories etc. outside the pump house for Transformer :								
c.1	Transformer								
i	53.33MVA, 220/132/33 KV, 1-phase Autotransformer	Sets	4						
C	Illumination System								
a	Control room cum administrative building illumination	LS	1						
b	Fire fighting building illumination	LS	1						
c	Switchyard lighting	LS	1						
d	Street lighting	LS	1						
e	Transit Camp illumination	LS	1						
f	245kV GIS Building including panel room	LS	1						
g	Township quarter (B-Type, 4 nos)	LS	1						
h	Township quarter (C-Type, 4 nos)	LS	1						
i	Township quarter (D-Type, 1 nos)	LS	1						

j	Car parkings	LS	1						
D	Air conditioning & ventilation System								
D.1	Air conditioning system								
(i)	Panel room in 245kV GIS Hall	LS	1						
D.2	Ventilation system								
(i)	245KV GIS hall	LS	1						
G	POWER & CONTROL CABLES								
b	Power Cables(PVC)- (1.1kV grade)	LS	1						
b	Power Cables (XLPE)(excluding 3.5Cx300 sqmm (XLPE) cable for filter Machine)- (1.1kV grade)	LS	1						
c	Control Cable (PVC)- (1.1kV grade)	LS	1						
d	Cable glands, lugs & straight through joints for Power & Control cables	LS	1						
H	Integration of all 220/132/33kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.		LS	1					
	Sub-Total Part-B								
	Part-C: Mandatory Spares								
(I)	Mandatory Spare List for Autotransformer								
	For 53.33MVA , 220/132/33 KV, 1-phase Autotransformer								
a)	Bushing of each rating with metal parts & gaskets and lifting tools	Set	1						
b)	Cooler fan with Motor	No.	1						
c)	Buchholz Relay(Main Tank) complete with floats and contacts	Set	1						
d)	Local and Remote WTI with sensing device and contact(each)	Set	1						
e)	Magnetic oil level gauge	No.	1						
f)	Strarters, contactors,switches & Relays for Electrical control panels(One ste of each type)	Set	1						
g)	Remote Tap postion Indiactor	No.	1						
h)	Spare insulating oil to be handed over to Owner after commisioning for O&M requirement	KL	10						
(II)	SPARES FOR 245kV GIS								
A)	General								

a.	SF6 gas Pressure Relief Devices, 1Nos. of each type	Set	1						
b.	SF6 Pressure gauge cum switch OR Density monitors and pressure switch as applicable (1 no. of each type)	Set	1						
c.	Coupling device for pressure gauge cum switch for connecting Gas handling plant	Set	1						
d.	Rubber Gaskets, "O" Rings and Seals for SF6 gas of each type	Set	1						
e.	Molecular filter for SF6 gas with filter bags(20% of total weight)	Set	1						
f.	All types of Control Valves for SF6 gas of each type	Set	1						
g.	SF6 gas (20 % of total gas quantity)	Set	1						
h.	All types of coupling for SF6 gas (1 no. of each type)	Set	1						
i.	Pipe length (Copper or Steel as applicable) for SF6 Circuit of each type	Set	1						
j.	Covers with all accessories necessary to close a compartment in case of dismantling of any part of the Enclosure to ensure the sealing of this compartment								
j.1	For 3 Phase Enclosure if applicable	Nos.	1						
j.2	For Single phase enclosure if applicable	Nos.	1						
k	Locking device to keep the Dis-connectors (Isolators) and Earthing switches in close or open position in case of removal of the driving Mechanism	Sets	1						
l	Bus Support insulator of each type for 3 phase/single phase enclosure.	Nos.	1						
m	SF6 to air bushing (245kV) as applicable	Sets	1						
B)	245 KV SF6 CIRCUIT BREAKER:								
a.	Complete Circuit Breaker pole of each type & rating complete with interrupter, main circuit enclosure and Marshalling Box with operating mechanism	Nos.	1						
b.	Rubber gaskets, 'O' rings and seals for SF6 gas (1 No. of each type)	Sets	1						
c.	Trip coil assembly with resistor as applicable	Sets	1						
d.	Closing coil assembly with resistor as applicable .	Sets	1						
e.	Relays, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	Sets	1						
f.	Closing coil assembly (including valve, if applicable)	Sets	1						
g.	Trip coil assembly (including valve, if applicable)	Sets	1						
h.	Auxiliary switch assembly of each type	Sets	1						
C)	245 KV ISOLATORS :								

a.	Complete set of 3-phase dis-connector including main circuit, enclosure, driving mechanism (one no of each type)	Sets	1						
b.	Single Phase/ 3-phase Earthing switch including main circuit, enclosure, driving mechanism.	Sets	1						
c.	Copper contact fingers for dis-connector male & female contact for one complete (3-phase) dis-connector of each type and rating	Sets	1						
d.	Copper contact fingers for earthing switch male & female contacts, for one complete(3-phase) earthing switch of each type and rating	Sets	1						
e.	Open / Close contactor assembly, timers, key interlock for one complete (3 phase) dis-connector and (3 phase) earthing switch (1 No. of each type and rating)	Sets	1						
f.	Push button switch - (1 No. of each type & rating) as applicable	Sets	1						
g.	Limit switch and Aux. Switches for complete 3 phase equipment								
g.1	For isolator	Sets	1						
g.2	For earth switch	Sets	1						
D)	245 KV CURRENT TRANSFORMER								
a.	Gas insulated complete CT of each type and rating with enclosure.	Nos.	1						
b.	Secondary bushing of each type	Sets	1						
E)	245 kV VOLTAGE TRANSFORMER								
a.	Gas insulated complete PT of each type and rating with enclosure.	Nos.	1						
(III)	SPARES FOR AIS EQUIPMENTS								
A	145kV CB								
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for								
	1250A, 31.5 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						
vi)	Molecular filter	Nos.	2						

vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)	Set	1						
viii)	Pressure switches / Density monitor (1 no. of each type)	Set	1						
ix)	Auxiliary switch assembly (for one pole of CB)	Set	1						
(B)	72.5 kV CB								
i)	Complete Pole of circuit breaker including pole column, interrupter, with driving mechanism and Marshaling Box but without support structure for 1250A, 31.5 KA (No. of Pole)	No.	1						
ii)	Rubber gaskets, 'O' rings and seals (for complete replacement of one pole of CB)	Set	1						
iii)	Trip coils with resistor	Nos.	2						
iv)	Closing coils with resistor	Nos.	1						
v)	Terminal Pads & connectors	Nos.	2						
vi)	Molecular filter	Nos.	2						
vii)	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc. (1 no. of each type)	Set	1						
viii)	Pressure switches / Density monitor (1 no. of each type)	Set	1						
ix)	Auxiliary switch assembly (for one pole of CB)	Set	1						
(C)	145kV Isolator								
i)	One complete pole including support Insulator, motor operating mechanism (MOM) with box but excluding structure 1250A, 31.5 KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts	Set	2						
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches	Set	1						
iv)	Limit Switch	Set	2						
v)	Terminal Pads & Connectors	Nos.	3						
(D)	72.5kV Isolator								
i)	One complete pole including support Insulator, MANUAL operating mechanism with box but excluding structure 1250A, 31.5KA, 1 E/S (no. of pole)	No.	1						
ii)	Copper contact fingers for male & female contacts (for one pole of Isolator)	Set	2						
iii)	Open/Close contactor assembly, timers, key interlock push button switch & auxilliary switches (for one pole of Isolator)	Set	1						
iv)	Limit Switch	Nos.	2						
v)	Terminal Pads & Connectors	Nos.	3						
(E)	145kV CT								
i	800A, 31.5 kA with 120% extended rating	No.	1						
(F)	CT(72.5 kV,1250A with 120% extended current rating)	No.	1						
(G)	CVT (245 kV,4400 pF)	No.	1						
(H)	CVT (145 kV,4400 pF)	No.	1						

(I)	72.5kV PT	No.	1						
(J)	216 SA								
i)	Complete LA	No.	1						
ii)	Surge counter/monitor	Nos.	5						
(F)	120kV SA								
i)	Complete LA	No.	1						
ii)	Surge counter/monitor	Nos.	5						
(G)	C&R PANELS								
i)	Transformer protection panel :								
a)	Transformer differential protection	No.	1						
b)	REF protection relay with non-linear resistor	No.	1						
c)	Directional over current & E/F Protection Relay	No.	1						
ii)	Line protection panel :								
a)	Distance Protection relay- Main-1	No.	1						
b)	Current differential Protection relay- Main-2	No.	1						
iv)	Breaker Relay panel:								
a)	Breaker failure relay	No.	1						
b)	Trip circuit supervision relay	Nos.	2						
c)	Self reset trip relay (relay of each type)	Set	1						
d)	Hand reset trip relay(relay of each type)	Set	1						
e)	Timer relay(relay of each type)	Set	1						
f)	DC supervision relay(relay of each type)	Set	1						
g)	Flag relays(relay of each type)	Set	1						
h)	Auxiliary relays(relay of each type)	Set	1						
(H)	Teleprotection Equipments								
ii)	Set of prints for protection coupler(digital)	Set	1						
(I)	SAS								
i)	Bay Control Unit (IED) of each type	Set	1						
ii)	Ethernet Switch of each type	Set	1						
(J)	BATTERY CHARGER(220kV)								
i)	Set of control cards	Set	1						
ii)	Set of relays	Set	1						
iii)	Rectifier transformer	No.	1						
iv)	Thyristor/diode	Set	1						
v)	Fuses of Thyristor with indicators	Set	6						
(K)	COMMON SPARES								
i)	Bay unit Module	No.	1						
ii)	2 wire local subscriber interface card for PABX	No.	1						

iii)	E1 Interface card for PABX	No.	1						
	Sub-Total Part-C								
	Total For Extension of 220/132kV Marsyangdi Substation (220 kV GIS & 132 kV AIS) [(I-B)-(Part-A+ Part-B+ Part C)]								
	Total for Schedule 1 (Total of column 9 to be carried forward to Schdule 5: Grand Summary)								

Note : 1) Bidder is required to quote prices in this Schedule for all the individual items/sub-items.

2.) The Prices of equipments are inclusive of type test charges except for power transformers mentioned in Sch 4(e).

3.) BOQ given above is indicative only based on the scope of work as given in Employer's Requirements. The quantities mentioned above may undergo change during

Specify currency in accordance with BDS ITB Clause 32.1,
Part-I of the Bidding Documents.

* Strike-out whichever is not applicable.

Name of Bidder:
Signature of Bidder:

Date:

(Printed Name)

(Designation)

(Common Seal)

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project
Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule A-3: Design Services

Item No.	Item Description	Estimated		Unit Prices		Total Prices	
				Local Currency Portion	Foreign Currency Portion		
		Quantity	Unit	NRs	Currency	LC	FC
1	2	3	4	5	6	7=3x5	8=3x6
	Total (Total of column 7 and 8 to be carried forward to Schedule No. 5: Grand Summary)						

Name of Bidder:
Signature of Bidder:
 (Printed Name)
 (Designation)
 (Common Seal)

Date:

NEPAL ELECTRICITY AUTHORITY

PROJECT MANAGEMENT DIRECTORATE

SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
I-A	Extension of 220/132/33kV Matatirtha Substation									
	Part-A : EMPLOYER ASSESSED QUANTITIES									
A1	POWER TRANSFORMER									
A1.1	POWER TRANSFORMER									
A1.1.1	1-Ph Autotransformers									
a)	53.33MVA , 220/132/33 KV, 1-phase Autotransformer (Excluding insulating oil)			Nos.	7					
b)	Insulating oil for 53.33MVA , 220/132/33 KV, 1-phase Autotransformer (* 1Lot = Oil for 1Autotransformers)			Lot*	7					
c)	33kV Current transformer (NCT) for autotrasnformer			No	2					
A2	LT TRANSFORMER									
1.0	630 kVA,33/0.400kV			Nos	2					
B	245 kV equipment									
1.0	245 kV Circuit Breakers (3-Phase) with support structure									
a	1600A, 40KA			Nos	7					
b	2500A, 40KA			No	1					
2.0	245kV Isolator (3-phase)-Double Break									
a	1600A, 40 KA, Isolator with one E/S			Nos	7					
b	1600A, 40 KA, Isolator with two E/s			Nos	7					
c	1600 A, 40KA, Tandem Isolator without E/S			Nos	13					
d	2500A, 40 KA, Isolator with two E/s			Nos	2					
3.0	245 kV Current Transformer (1-Phase)									
a	1600A, 40KA with 120% extended current rating			Nos	21					
b	1600 A, 40KA with 150% extended current			Nos	3					
4.0	245 kV Capacitive Voltage Transformer (1- Phase)									
a	4400 pF			Nos.	18					
5.0	216 kV Surge Arrestors (1-phase)			Nos.	19					

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SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
6.0	245 kV Bust Post Insulator (Except auxiliary buses of transformer)			Nos	90					
C	145 kV equipment									
4.0	145 kV Surge Arrestors									
a	120 kV Surge Arrestors (1- Phase)			Nos	7					
5.0	Bus post insulators (Except auxiliary buses of transformer)			Set	14					
D1	72.5kV EQUIPMENT									
1.1	72.5 kV, 1250A, 31.5kA Circuit Breaker (3-phase) with support structure			No.	1					
1.2	72.5 kV, 1250A,31.5kA Isolators with earth switch (3-phase, DBR type)			No.	1					
1.3	72.5kV, 1250A, 31.5 kA with 120% extended rating CT.			Nos.	3					
1.4	72.5kV PT.(1-phase)			Nos.	3					
1.5	72.5 kV BPI (1-phase)			Nos.	6					
D.2	33kV Equipments									
1.1	33 kV, 630A Isolators with out earth switch (3-phase, DBR type)			No.	1					
1.2	30 kV Surge Arrestors (1-phase)			Nos.	3					
1.3	36 kV BPI			Nos.	3					
1.4	36 kV HG Fuse along with support insulator (1-phase)			Nos.	3					
E	RELAY PANELS (WITH AUTOMATION)									
1.0	220 kV									
a	Circuit Breaker Relay Panel									
i	With Auto Reclose			Set	5					
ii	With out Auto Reclose			Set	3					
b	Line Protection Panel (Matatirtha -Marsyangdi)			Set	2					
c	Line Protection Panel (Matatirtha –Trishuli)			Set	2					
d	Current Differential Relay for other end of line (Upper Trishuli 3A Line)			Nos	2					
e	Transformer Protection Panel (For both HV & MV side)			Set	2					
f	Bus Bar Protection Panel			Set	1					

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SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
E1	Dismantling, shifting in switchyard panel room and re-erection of existing cable differential protection of cable portion for Upper Trishuli 3A Line (one line=1 Set)			Set	2					
F	COMMON EQUIPMENTS									
1.0	Special Relay Test Tool kit			No	1					
G	SUBSTATION AUTOMATION									
G.1	Complete Substation Automation System (SAS) for substation including hardware and software for the substation & remote control stations alongwith associated equipments for the following bays as per Technical Specification									
a	Main bays to be automated									
i	220 kV system			Bay Nos	8					
ii	Bays to be automated of existing 132 kV substation			Bay Nos	10					
iii	Bays to be automated of existing 33 kV substation			Bay Nos	8					
iv)	Bays to be automated of existing 11 kV substation			Bay Nos	11					
v)	BCU for controlling & monitoring of Auxilary System			Set	1					
H	Teleprotection & communication Equipments									
a	Digital Protection Coupler			Nos	6					
h	PABX with following configuration as per TS			Set	1					
i)	2 wire subscriber interface card with capacity 32 local subscribers (along with 32 nos. Instruments)									
ii)	4 wire E & M interface card with capacity 8 nos. trunks (For PLCC)									
iii)	E-1 interface with 2 trunks G-703									
iv)	2 wire interface with 1 trunk (For PSTN)									
i	Testing & Maintenance equipment (print test kit only)			Set	1					
j	4 wire telephone equipment			No	1					
I	LT Switchgear (As per Technical specification)									
a	415V Main switchboard			Set	1					
b	415V ACDB			Set	1					
c	415V MLDB			Set	1					
d	415V Emergency LDB			Set	1					
e	220V DCDB			Sets	2					

Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

[illegible]

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
1	Transmission Equipment									
	(i) SDH Equipment (STM- 4 MADM, upto 3 MSP protected directions)									
	(a) Base Equipment (Common cards, Cross-connect/control cards, Optical base cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, patch cords, DDF etc. fully equipped excluding (ii) and (iii) below)			No.	1					
	(ii) Optical Interface/SFP# for									
	(a) S1.1			Nos.	4					
	(b) S1.1 **			Nos.	2					
	(c) L4.2			Nos.	2					
	(iii) Tributary Cards									
	i E1 Interface card (Minimum 16 interfaces per card)			Nos.	1					
	ii Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)			No.	2					
2	Termination Equipment									
A1	Drop/Insert Multiplexer									
	Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards)			Nos.	1					
A2	Subscriber Line Interface Cards									
	(a) 2 wire (sub/sub) voice channel cards (min 8 channels per card)			Nos.	1					
	(b) 4 wire (E&M) voice channel cards (min 8 channels per card)			Nos.	1					
	(c) Asynchronous Sub Channels data cards (minimum 4 channels per card)			Nos.	1					
	(d) Synchronous data card (NX64kbps)			No.	1					
3	Equipment Cabinets									
	(a) For Drop/Insert Multiplexer			No.	1					
	(b) For SDH Equipment			No.	1					
4	TMN – Craft Terminal for SDH & PDH Equipments									
	(a) Hardware			Set*	1					
	(b) Software			Set*	1					
5	Main Distribution Frame(100 pairs)			No.	1					

Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

[illegible]

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTL-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
b	For spare unit of 220/132/36 kV auto transformer connection through auxiliary buses, Neutral formation and delta formation (for two banks): Required 245 kV BPI for HV auxiliary bus, 132 kV BPI for 132 kV Auxiliary bus, 72.5 kV BPI for tertiary auxiliary bus & delta formation, 36 kV BPI for Neutral formation & Neutral auxiliary bus including Al tube, bus-bar materials, clamps, spacers, connectors, including equipment connectors, support structures , Earthing of spare unit as per technical specification.			Set	1					
c	Erection Hardware etc for 72.5kV equipments & LT Transformer connection			Set	1					
A1	Connection of 132 kV side of Transformer on exiting 132kV Bays									
i	132 kV cable (with Copper conductor) of suitable current rating along with cable termination kit (both end i.e.Transformers 132 kV end and 132 bay end) for 132 kV side of Transformer connection on exiting 132kV Bays connection as per specification for			Set	2					
A2	Earthing and lightning protection including necessary connectors/connections, risers etc. complete in all respect (but excluding LM structures for Lightning protection)									
i	Earth Conductor (copper)			LS	1					
ii	Earth Rod (copper clad steel)			LS	1					
iii	Equipment for lightning protection			LS	1					
B	Fire Protection System									
a	Pumping arrangement for HVW system & hydrant system, complete with all piping, valves, fittings, etc. inside pump house									
i	220/132kV (New) Substation			Set	1					
b	Hydrant system, complete U/G piping and accessories etc. outside the Pump House.									
i	220/132kV (New) Substation			Set	1					
c	HVV spray system, Hydrant system and complete U/G & O/G piping and accessories etc. outside the pump house for Transformer :									
c.1	Transformer									
i	53.33MVA , 220/132/33 KV, 1-phase Autotransformer			Sets	7					
C	Illumination System									
a	Fire fighting building illumination			LS	1					
b	Illumination System for switchyard panel room									
i	220KV			Sets	4					
c	Control room cum administrative building illumination			LS	1					
d	Switchyard lighting			LS	1					

NEPAL ELECTRICITY AUTHORITY

PROJECT MANAGEMENT DIRECTORATE

SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTL-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
e	Street lighting			LS	1					
f	Township quarter (B-Type, 4 nos)			LS	1					
g	Township quarter (C-Type, 4 nos)			LS	1					
h	Security room			LS	1					
i	Car parkings			LS	1					
D	Air conditioning System									
a	Air conditioning for S/Y panel room									
i	220KV			Sets	4					
E	POWER & CONTROL CABLES									
a	Power Cables(PVC)- (1.1kV grade)			LS	1					
b	Power Cables (XLPE)(excluding 3.5Cx300 sqmm (XLPE) cable for filter Machine- (1.1kV grade)			LS	1					
c	Control Cable (PVC)- (1.1kV grade)			LS	1					
d	Cable glands, lugs & straight through joints for Power & Control cables			LS	1					
F	Integration of all 220/132/33kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.			LS	1					
	Sub-Total Part-B									
	PART-C: Civil Works (As per technical specification)									
1.0	Excavation in all types of soil and rock including backfilling disposal etc. for all leads and lifts			Cu.Mtr.	22100					
2.0	Providing and laying of Plain Cement Concrete (PCC) (1:4:8)			Cu.Mtr.	1250					
3.0	Providing and laying of Plain Cement Concrete (PCC) (1:2:4)			Cu.Mtr.	400					
4.0	Providing and laying of Reinforced Cement Concrete Design Mix (M25) including pre cast, shuttering, Grouting of pockets & underpinning but excluding steel reinforcement.			Cu.Mtr.	5260					
5.0	Providing and laying Plain Cement Concrete 1:5:10 (1 cement : 5 sand : 10 Stone aggregate)			Cu.Mtr.	2250					
6.0	Steel Reinforcement (Fe 500)			MT	340					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
7.0	Miscellaneous Structural steel used for rails , plates for rail fixing, ,gratings, gratings supports etc for transformer / reactor foundation,cable supportstand earthing cleats ,chequered plates, embedments, edge protection angles for cable trenches but excluding the reinforcement steel and steel for lattice and pipe structures which shall be paid seperately.			MT	60					
8.0	Stone filling (40mm) over grating of Transformer / reactor Foundation			Cu.Mtr.	40					
9.0	Stone spreading including antiweed treatment in switchyard but excluding PCC.			Sq. Mtr.	30000					
10.0	Supplying & laying hume pipe with collars of grade (NP-3) but excluding concrete of bed/support/encasing of hume pipes which shall be paid seperately under respective items of BPS									
i)	250mm dia			RM	150					
ii)	300mm dia			RM	120					
iii)	450mm dia			RM	80					
iv)	600mm dia			RM	40					
v)	900 mm dia			RM	300					
11.0	Concrete road as per technical specification and approved drawing but excluding reinforcement & concrete which shall be paid seperately under respective items of BPS									
a.	Concrete Road			Sq. m.	3000					
11.1	Construction of BlackTop(Bituminous/asphaltic) road as per Specification and approved drawing, all Complete									
a.	Black top/bitumineous (asphaltic) Road			Sq.m.	2000					
12.0	Construction of rail-cum-raod as per technical specification and approved drawing including all items such as excavation, compaction, rolling, watering, WBM, etc but excluding concrete, reinforcement and structural steel which shall be paid seperately under respective items of BPS									
a.	Section having two rails			Sq. m.	550					
13.0	Chain link fencing as per technical specification and approved drawing but excluding concrete which shall be paid seperately under respective items of BPS			RM	200					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
14.0	Switch yard Gate excluding concrete which shall be paid seperately under respective items of BPS			Nos.	2					
15.0	Supplying and erecting dewatering pumps									
a.	5 HP			Nos.	2					
b.	0.5 HP			Nos.	2					
16.0	All civil works for construction of drains as per technical specification and approved drawing excluding concrete which shall be paid seperately under respective items of BPS									
a.	Type AA (300mm wide x Depth up to 600mm)			RM	1800					
b.	Type BB (450 wide x Depth From 600 to 900mm)			RM	1400					
c.	Type CC (600 wide x Depth From 900 to 1200mm)			RM	1400					
d.	Type DD (750 wide x Depth From 1200 to 1500mm)			RM	1200					
17.0	External water supply as per technical specification from borewell/single point of water supply within substation boundary to Fire water Tank, control room Building and other buildings as applicable including all items like excavation, pipes, fittings, jointings, valves, chambers/ manholes etc									
a.	80mm Dia GI Pipe			RM	100					
b.	50mm dia GI pipe			RM	80					
c.	40mm dia GI pipe			RM	60					
d.	25mm Dia GI Pipe			RM	40					
18.0	External sewerage system including all item such as excavation, piping, pipe fittings, manholes, gali trap, gali chamber etc.									
a.	(i) 250 mm Dia.			RM	50					
b.	(i) 150 mm Dia.			RM	50					
19.0	Local Sand filling around and under DG Set Foundation and other foundations as applicable.			Cu.Mtr.	300					
20.0	Stone soling below foundations wherever specified in approved drawings during detailed engineering			Cu.Mtr.	200					
21	All civil works as per technical specification and approved drawing including internal finish but excluding excavation, PCC, RCC, reinforcement steel and external finishing which shall be paid seperately under respective items of BPS									
i	Control room cum administrative building (Double story) as per TS			Sq. m.	750					
ii	Fire fighting pump house buliding as per TS			Sq. m.	98					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
iii	Fire fighting Water tank			LS	1					
iv	Switch yard Panel Room (6.0 M X 3.9 M).			Sq. m.	96					
v	Township (quarters)									
(a)	B type			Sq. m.	500					
(b)	C type			Sq. m.	600					
vi	Car Parking shed (for 10 cars)			LS	2					
22	External finish as per specification for following buildings:									
i	Control room cum administrative building (Double story) as per TS			Sq. m.	750					
ii	Fire fighting pump house buliding as per TS			Sq. m.	98					
iii	Fire fighting Water tank			LS	1					
iv	Switch yard Panel Room (6.0 M X 3.9 M).			Sq. m.	96					
v	Township (quarters)									
(a)	B type			Sq. m.	500					
(b)	C type			Sq. m.	600					
vi	Car Parking shed (for 10 cars)			LS	2					
23	Septic tank as per specification and approved design according to International/British standards and soak pit as per approved drawing excluding concrete & reinforcement (For 50 users)			LS	3					
24	Geotechnical /Soil Investigation as per technical specification			LS	1					
25	Site levelling									
a)	Earth work in cutting & Filling in all types of soils including soft/ disintegrated rock			Cu.Mtr.	50000					
b)	Earth work in Filling with borrowed earth			Cu.Mtr.	10000					
26	All civil works for Boundary wall including excavation, concrete, reinforcement steel ,structural steel, plaster, painting, barbed wire and concertina coil etc all complete as per technical specification (2.5 m high brick masonry wall and 0.5 m high angle support on top).			RM	1200					
27	All civil works for security room as per TS including septic tank and soak pit. Internal and external finish, sanitary and plumbing works, plinth protection etc. to complete the building are included in the item.			Sq. m.	18					
28	Main boundary wall Gate (Steel) including all works complete as per technical specification			LS	2					

NEPAL ELECTRICITY AUTHORITY

PROJECT MANAGEMENT DIRECTORATE

SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
29	Construction of retaining wall with random Rubble masonry in cement sand mortar (1:6) including levelling up with cement concrete (1:6:12),providing weep holes of PVC pipes (150 mm dia) with necessary filter material at the mouth of weep holes,50 mm thick cement concrete (1:2:4) copping on the top of wall, 100 mm thick PCC (1:4:8) below RR masonry work,excavation of foundation for all lifts up to 3m above lower level . Item of excavation, PCC (1:2:4 & 1:4:8) shall be measured and paid seperately under respective items of BPS			Cu. M	15000					
30.0	Supplying, providing stone work packed in steel wire crats as per design & drawing to be developed by the contractor for all leads & lifts along the boundary wall & other places as required.			Cu. M	5000					
31.0	Approach Road- Construction of 3.75 m wide black top (Bituminous/asphalt) road with 3.75 m wideblack top pavement and 1.3 m wide earthen shoulders on either side of road, Water bound macadum of suitable thickness as per design below pavement shall be laid as per technical specification.			Sq. M	4000					
32	Dismantling of existing boundary wall (about 2.5 m high) of stone masonry wall with about 1.0 m high steel grill above top of masonry wall including disposal of debris, stacking of sevicable material etc. at the place within the the boundary wall of substaion as per dirction of engineer incharge.Bidder is advised to visit site to acquaint themselves with the detail of existing boundary wall			RM	300					
33	Dismantling of existing RR masonry retaining wall including stacking of serviceable material like stones/boulders etc at suitable place within sub station boundary wall at a place to be decided by Engineer-In - Charge and disposal of unserviceable material/debris within 2 Km at a place to be finalised with Engineer In Charge			Cu. M	300					
34.0	All civil works for store building complete in all respect as per technical specification and approved drawing including finishing, steel truss CGI sheet, doors windoows, shutters, brick works etc but excluding excavation, PCC, RCC, reinforcement steel which shall be paid seperately under respective items of BPS									
i	Closed type store			Sq. m.	150					
ii	Semi closed type store			Sq. m.	150					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
	Sub-Total Part-C									
	Total for Extension of 220/132/33kV Matatirha Substation (I-A) (Part-A+ Part-B+ Part C)									
I-B	Extension of 220/132/33kV Marsyangdi Substation (220 kV GIS & 132 kV AIS)									
	Part-A : EMPLOYER ASSESSED QUANTITIES									
A1	POWER TRANSFORMER									
A1.1	POWER TRANSFORMER									
a)	53.33MVA , 220/132/33 KV, 1-phase Autotransformer (Excluding insulating oil)			Nos.	4					
b)	Insulating oil for 53.33MVA , 220/132/33 KV, 1-phase Autotransformer (* 1Lot = Oil for 1Autotransformers)			Lot*	4					
c)	33kV Current transformer (NCT) for autotrasnformer			No	1					
A2	LT TRANSFORMER									
1.0	630 kVA,33/0.400kV			Nos	1					
B	245 kV equipment									
B1	420KV GIS Equipment									
1.01	245kV, SF6 GIS Bus Bars Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (a) of Section Project]			Set	2					
1.02	245kV, SF6 GIS ICT bay Module [Module description as per Technical specification, Cl. No. 2.2.2.1.1, (b) of Section Project]			Set	2					
1.03	245kV, SF6 GIS Line bay Module [Module description as per Technical specification, Cl. No.2.2.2.1.1, (d) of Section Project]			Set	8					

Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

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Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

[illegible]

Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

[illegible]

Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

[illegible]

NEPAL ELECTRICITY AUTHORITY

PROJECT MANAGEMENT DIRECTORATE

SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

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		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
(a)	2 wire (sub/Exch) voice channel cards (min 8 channels per card)			No.	1					
(b)	4 wire (E&M) voice channel cards (min 8 channels per card)			No.	1					
(c)	Asynchronous Sub Channels data cards (minimum 4 channels per card)			No.	1					
(d)	Synchronous data card (NX64kbps)			No.	1					
2	Equipment Cabinets									
(a)	For Drop/Insert Multiplexer			No.	1					
3	Main Distribution Frame(100 pairs)			No.	1					
	Note# :Optical interface/SFP can be provided with Optical base card or Control card with the condition that control card shall not be equipped with more than one Optical interface/SFP and optical card with not more than two Optical interface/SFP. However main and protection channel shall be terminated on separate cards									
	Note*: Set shall include all required hardware/software for complete TMN –Craft Terminal system as specified in technical specifications.									
	Note** : Consider for existing equipment installed at Matatitha (Existing) and Optical Interface Card(s)/SFP shall be suitable to integrate with equipment installed Marsyangdi Substation (Existing).									
	Sub-Total Part-A									
	Part-B: CONTRACTOR ASSESSED QUANTITIES									
A	Erection Hardware									
	Insulator strings, Disc Insulators, Hardware, conductor, Al tube, bus-bar materials, cable trays, clamps, spacers, connectors including equipment connectors, Junction box, earthwire, buried cable trenches/pipe equipment & lighting, all accessories etc. for the following:									
a	245kV GIS Termination Arrangement:									
i	Line Bay			Set	8					
ii	Transformer Bay (including 220 kV AIS connection for spare unit with GIS auxiliary bus module)			Set	2					
b	For 132 kV (Double Main Layout)									
i	Transformer Bay			Set	1					
ii	Bus work (For four bays, excluding bus post insulators)			Set	1					

Marsyangdi-Kathmandu 220 kV Transmission Line Project
ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

(a): Installation and Construction Charges

[illegible]

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
D	Air conditioning & ventilation System									
D.1	Air conditioning system									
(i)	Panel room in 245kV GIS Hall			LS	1					
D.2	Ventilation system									
(i)	245KV GIS hall			LS	1					
G	POWER & CONTROL CABLES									
b	Power Cables(PVC)- (1.1kV grade)			LS	1					
b	Power Cables (XLPE)(excluding 3.5Cx300 sqmm (XLPE) cable for filter Machine)- (1.1kV grade)			LS	1					
c	Control Cable (PVC)- (1.1kV grade)			LS	1					
d	Cable glands, lugs & straight through joints for Power & Control cables			LS	1					
H	Integration of all 220/132/33kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.			LS	1					
Sub-Total Part-B										
PART-C: Civil Works (As per technical specification)										
1.0	Excavation in all types of soil and rock including backfilling disposal etc. for all leads and lifts			Cu.Mtr.	17600					
2.0	Providing and laying of Plain Cement Concrete (PCC) (1:4:8)			Cu.Mtr.	1750					
3.0	Providing and laying of Plain Cement Concrete (PCC) (1:2:4)			Cu.Mtr.	650					
4.0	Providing and laying of Reinforced Cement Concrete Design Mix (M25) including pre cast, shuttering, Grouting of pockets & underpinning but excluding steel reinforcement.			Cu.Mtr.	5380					
5.0	Providing and laying Plain Cement Concrete 1:5:10 (1 cement : 5 sand : 10 Stone aggregate)			Cu.Mtr.	2250					
6.0	Steel Reinforcement (Fe 500)			MT	430					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTL-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
7.0	Miscellaneous Structural steel used for rails , plates for rail fixing, ,gratings, gratings supports etc for transformer /reactor foundation,cable supportstand earthing cleats ,chequered plates, embedments, edge protection angles for cable trenches but excluding the reinforcement steel and steel for lattice and pipe structures which shall be paid seperately.			MT	30					
8.0	Stone filling (40mm) over grating of Transformer /reactor Foundation			Cu.Mtr.	40					
9.0	Stone spreading including antiweed treatment in switchyard but excluding PCC.			Sq. Mtr.	30000					
10.0	Supplying & laying hume pipe with collars of grade (NP-3) but excluding concrete of bed/support/encasing of hume pipes which shall be paid seperatelyunder respective items of BPS									
i)	250mm dia			RM	150					
ii)	300mm dia			RM	120					
iii)	450mm dia			RM	80					
iv)	600mm dia			RM	40					
11.0	Concrete road as per technical specification and approved drawing but excluding reinforcement & concrete which shall be paid seperately under respective items of BPS									
a.	Concrete Road			Sq. m.	5625					
12.0	Construction of rail-cum-raod as per technical specification and approved drawing including all items such as excavation, compaction, rolling, watering, WBM, etc but excluding concrete, reinforcement and structural steel which shall be paid seperately under respective items of BPS									
a.	Section having two rails			Sq. m.	320					
13.0	Chain link fencing as per technical specification and approved drawing but excluding concrete which shall be paid seperately under respective items of BPS			RM	300					
14.0	Switch yard Gate excluding concrete which shall be paid seperately under respective items of BPS			Nos.	2					
15.0	Supplying and erecting dewatering pumps									
a.	5 HP			Nos.	2					
b.	0.5 HP			Nos.	2					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTL-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
16.0	All civil works for construction of drains as per technical specification and approved drawing excluding concrete which shall be paid separately under respective items of BPS									
a.	Type AA (300mm wide x Depth up to 600mm)			RM	1500					
b.	Type BB (450 wide x Depth From 600 to 900mm)			RM	600					
c.	Type CC (600 wide x Depth From 900 to 1200mm)			RM	600					
d.	Type DD (750 wide x Depth From 1200 to 1500mm)			RM	300					
17.0	External water supply as per technical specification from borewell/single point of water supply within substation boundary to Fire water Tank, control room Building and other buildings as applicable including all items like excavation, pipes, fittings, jointings, valves, chambers/manholes etc									
a.	80mm Dia GI Pipe			RM	100					
b.	50mm dia GI pipe			RM	80					
c.	40mm dia GI pipe			RM	60					
d.	25mm Dia GI Pipe			RM	40					
18.0	External sewerage system including all item such as excavation, piping, pipe fittings, manholes, gali trap, gali chamber etc.									
a.	(i) 250 mm Dia.			RM	50					
b.	(i) 150 mm Dia.			RM	50					
19.0	Local Sand filling around and under DG Set Foundation and other foundations as applicable.			Cu.Mtr.	300					
20.0	Stone soling below foundations wherever specified in approved drawings during detailed engineering			Cu.Mtr.	200					
21	All civil works as per technical specification and approved drawing including internal finish but excluding excavation, PCC, RCC, reinforcement steel and external finishing which shall be paid separately under respective items of BPS									
i	Transit Camp			Sq. m.	420					
ii	Fire fighting pump house buliding as per TS			Sq. m.	98					
iii	Fire fighting Water tank			LS	1					
iv	Township (quarters)									
(a)	B type			Sq. m.	500					

NEPAL ELECTRICITY AUTHORITY

PROJECT MANAGEMENT DIRECTORATE

SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
(b)	C type			Sq. m.	600					
(c)	D type			Sq. m.	210					
v	Car Parking shed (for 10 cars)			LS	2					
22	External finish as per specification for following buildings:									
i	Transit Camp			Sq. m.	420					
ii	Fire fighting pump house buliding as per TS			Sq. m.	98					
iii	Fire fighting Water tank			LS	1					
iv	Township (quarters)									
(a)	B type			Sq. m.	500					
(b)	C type			Sq. m.	600					
(c)	D type			Sq. m.	210					
v	Car Parking shed (for 10 cars)			LS	2					
23	Septic tank as per specification and approved design according to International/British standards and soak pit as per approved drawing excluding concrete & reinforcement (For 50 users)			LS	3					
24	Geotechnical /Soil Investigation as per technical specification			LS	1					
25	Site levelling									
a)	Earth work in cutting & Filling in all types of soils including soft/disintegrated rock			Cu.Mtr.	30000					
b)	Earth work in Filling with borrowed earth			Cu.Mtr.	5000					
29	Construction of retaining wall with random Rubble masonry in cement sand mortar (1:6) including levelling up with cement concrete (1:6:12),providing weep holes of PVC pipes (150 mm dia) with necessary filter material at the mouth of weep holes,50 mm thick cement concrete (1:2:4) copping on the top of wall, 100 mm thick PCC (1:4:8) below RR masonry work,excavation of foundation for all lifts up to 3m above lower level . Item of excavation, PCC (1:2:4 & 1:4:8) shall be measured and paid seperately under respective items of BPS			Cu. M	10000					
30.0	Supplying, providing stone work packed in steel wire crats as per design & drawing to be developed by the contractor for all leads & lifts along the boundary wall & other places as required.			Cu. M	1000					

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTL-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(a): Installation and Construction Charges

Sl. No.	Item Description	Installation Charges								
		Country of Origin	Type & Designation	Unit	Qty.	Portion in Foreign Currency			Portion in Nepalese Currency (in NPR)	
						Currency#	Unit Rate	Total Charges	Unit Rate	Total Charges
(1)	(2)	(3)	(4)	(5)	(6)	7	8	9=8x6	10	11=10x6
31.0	All Civil works for Control Room Building (PEB) including finishing, internal cable trench, etc. complete as per technical specification and approved drawings, excluding excavation, PCC, RCC and reinforcement steel which shall be measured and paid separately under respective items of BPS.			Sq. m.	750					
32.0	All Civil works for 245 kV GIS Hall Building (PEB) including finishing, internal cable trench, etc. complete as per technical specification and approved drawings, excluding excavation, PCC, RCC and reinforcement steel which shall be measured and paid separately under respective items of BPS.			Sq. m.	1100					
33.0	All civil works for store building complete in all respect as per technical specification and approved drawing including finishing, steel truss CGI sheet, doors windows, shutters, brick works etc but excluding excavation, PCC, RCC, reinforcement steel which shall be paid separately under respective items of BPS									
i	Closed type store			Sq. m.	150					
ii	Semi closed type store			Sq. m.	150					
	Sub-Total Part-C									
	Total For Extension of 220/132kV Marsyangdi Substation (220 kV GIS & 132 kV AIS) (Part-A+ Part-B+ Part C)									
	Total for Schedule 4(Total of column 9 and 11 to be carried forward to Schedule 5: Grand Summary)									

Specify currency in accordance with ITB Clause 12.1 and corresponding BDS clauses, Vol.I of the Bidding Documents.

Name of Bidder:
Signature of Bidder:
(Printed Name)
(Designation)
(Common Seal)

Date:

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(b): Training Charges for training to be imparted abroad

Sl. No.	Description	Item for which training is to be imparted.	Country where training is to be imparted	Nos. of Trainee	Training duration in days	Total Training Charges		
						Currency	Unit rate	Total Training Charges
1	2		3	4	5	6	7	8 = 4x5 x 7
A	Training to Owners personnel on Design , testing and Maintenance aspect as per Section Project, Technical Specification at manufacturer's works	i) Control & Protection and Substation Automation System		4	10			
		ii) Switchyard Equipments (CT, CVT, Isolator and Circuit Breaker) and GIS Equipments		5	10			
		iii) Telecommunication Equipment (SDH ,MUX & NMS (Craft Terminal)) and PLCC		3	5			
	Total for Training Charges (total of column 8 to be carried forward to Schedule 5: Grand summary)							

Name of Bidder:
Signature of Bidder:
 (Printed Name)
 (Designation)
 (Common Seal)

Date:

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project

Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(c):Training Charges for training to be imparted to Employer's Personnel by Bidder's Instructor in Nepal

Sl. No.	Description of the Test		Training duration in days		Training Charges for Contractors Trainers	
		Item for which training is to be imparted.		Currency	Unit rate	Total Training Charges
1	2	3	4	5	6	7 = 4x 6
a)	On Job training on operation, maintenance and testing & commissioning aspect at each substation as per section Project, Technical Specification	i) Control & Protection	5			
		ii) Substation Automation System including integration aspect of existing SCADA (of Siemens supplied SINAUT Spectrum Software) at Load Dispatch Center	5			
		iii) Switchyard Equipments (CT, CVT, Isolator and Circuit Breaker) (applicable for Matatirtha Substation))	4			
		iv)GIS equipment (applicable for Marsyangdi Substation)	4			
		iv) Telecommunication Equipment (SDH, MUX & NMS (Craft Terminal)) and PLCC	5			
		v) Transformers	2			
	Total for Training Charges (Total of column 7 to be carried forward to Schedule 5: Grand Summary)					

2. On Job Training in Nepal: The traveling and living expenses of Owner's personnel for the training programme conducted in Nepal shall be borne by the Owner.

Date:

Signature: _____

Printed Name: _____

Designation: _____

Common Seal: _____

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project
Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4 : Installation and Other Services

(d): Maintenance Charges

SI No	Description	Unit	Qty.	Total Maintenance Charges	
				Currency	Total Maintenance Charges
1	Maintenance Charges for Communication Equipments including SDH & MUX. for One (1) year during Warranty period	Year	1		
2	Maintenance Charges for Communication Equipments including SDH & MUX. for Six (6) years after Warranty period	Year	6		
	Total Maintenance Charges (To be carried forward to Schedule 5: Grand Summary)				

Date: _____

Signature: _____

Printed Name: _____

Designation: _____

Common Seal: _____

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project
Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4(e)

Type Test Charges for Type Tests to be conducted abroad

Sl. No.	Description of Tests		Testing Location	TEST CHARGES	
				Currency #	Amount
1	2		3	4	5
	220/132/33kV 1-Ph , 53.33 MVA Auto Transformer (for Matatirtha& Marsyangdi Substations)				
1	220/132/33kV Auto Transformer	Temperature rise test			
2		Measurement of harmonic level in no load current			
3		Measurement of acoustic noise level			
4		Measurement of Zero seq. reactance			
5		Measurement of power taken by fans and oil pumps			
	Total of Type Tests charges (Total of column 5 to be carried forward to Schedule 5: Grand Summary)				

Date: _____ Signature: _____

Printed Name: _____

Designation: _____

Common Seal: _____

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project
Marsyangdi-Kathmandu 220 kV Transmission LineProject

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 4(f)

Type Test Charges for Type Tests to be conducted in Nepal.

Sl. No.	Description of Tests		Testing Location	TEST CHARGES	
				Currency #	Amount
1	2		3	4	5
	220/132/33kV 1-Ph , 53.33 MVA Auto Transformer (for Matatirtha& Marsyangdi Substations)				
1	220/132/33kV Auto Transformer	Temperature rise test			
2		Measurement of harmonic level in no load current			
3		Measurement of acoustic noise level			
4		Measurement of Zero seq. reactance			
5		Measurement of power taken by fans and oil pumps			
	Total of Type Tests charges (Total of column 5 to be carried forward to Schedule 5: Grand Summary)				

Date: _____ Signature: _____

Printed Name: _____

Designation: _____

Common Seal: _____

NEPAL ELECTRICITY AUTHORITY
PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project
Marsyangdi-Kathmandu 220 kV Transmission Line Project

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 5: Grand Summary

Sl. No.	Description	Total Price Foreign ()*	Total Price Local ()*
1	TOTAL SCHEDULE NO. 1		
	Plant and Equipment including Mandatory Spares to be supplied from abroad.		
2	TOTAL SCHEDULE NO. 2		
	Plant and Equipment including Mandatory Spares Parts to be supplied from within Nepal		
3	TOTAL SCHEDULE NO. 3		
	Design Services		
4	TOTAL SCHEDULE NO. 4		
	(a) Installation and construction charges		
	(b) Training charges for training to be imparted abroad		
	(c) Training charges for training to be imparted in Nepal		
	(d) Maintenance charges		
	(e) Type Tests charges for type Tests to be conducted abroad		
	(f) Type Tests charges for type Tests to be conducted Nepal		
	GRAND TOTAL FOR PART B [1+2+3+4]		

Date:

Place:

Signature: _____

Printed Name: _____

Designation: _____

Common Seal: _____

NEPAL ELECTRICITY AUTHORITY**PROJECT MANAGEMENT DIRECTORATE
SASEC Power System Expansion Project
Marsyangdi-Kathmandu 220 kV Transmission LineProject**

ICB-PMD-MKTLP-072/73-03: Design, Supply, Installation and Commissioning of 220 kV AIS Substation at Matatirtha, Kathmandu & 220 kV GIS Substation at Markichowk, Marsyangdi

Schedule No. 6: Recommended Availability/Optional Spares Parts and recommended Test Equipment in line with technical Specifications

Item No.	Name & Description of Parts	Name of Original Manufacturer	Part No.	Number of Units in each set	Total No. of Sets to be provided	Unit Price	Total Price	Remarks

Date:

Signature: _____
Printed Name: _____
Designation: _____
Common Seal: _____