

# NEPAL ELECTRICITY AUTHORITY

(An Undertaking of Government of Nepal)

Project Management Directorate



## GHORAH I - MADICHAUR 132 KV TRANSMISSION LINE PROJECT

*A component of  
Electricity Grid Modernization Project*

### BIDDING DOCUMENT FOR

**Design, Supply, Installation, Testing and Commissioning of Ghorahi - Khungri (Madichaur)  
132 kV Transmission Line and Associated Substations at Khungri and Ghorahi.**

**(Procurement of Plant)**

**Single-Stage, Two-Envelope**

**Bidding Procedure**

<b>Issued on:</b>	<b>March 19, 2021</b>
<b>Invitation for Bids No.:</b>	<b>PMD/EGMP/GKTLSS-077/78-01</b>
<b>OCB No.:</b>	<b>PMD/EGMP/GKTLSS-077/78-01</b>
<b>Employer:</b>	<b>Nepal Electricity Authority</b>
<b>Country:</b>	<b>Nepal</b>

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**Ghorahi - Madichaur 132 KV Transmission Line Project  
Project Management Directorate  
Kharipati, Bhaktapur, Nepal  
Telephone: +977-9851186385**



# Transmission Line



**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Transmission Line**

F/C : Foreign Currency  
L/C : Local Currency

**Summary of Cost Estimate**

S. No.	DESCRIPTION	TOTAL AMOUNT	
		F/C(USD)	L/C (NRs)
1	Total Schedule No. 1: Supply and delivery of Plants and Equipments from abroad including Local Transportation, Insurance and other Incidental services.		
2	Total Schedule No. 1: Supply and delivery of Plants and Equipments within Nepal including Local Transportation, Insurance and other Incidental services.		
	SUB-TOTAL OF SUPPLY		
3	Total Schedule No. 3: Design Services		
4	Total Schedule No. 4:		
	a) Construction, Installation, Testing and commissioning works.		
	b) Training charges for training to be imparted abroad		
	c) Training Charges for training to be imparted to Employer's Personnel by Bidder's Instructor in Nepal		
	d) Maintenance Charges		
	e) Proto Type Testing of Towers		
	<i>Total</i>		

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

**Price Schedule for Schedule No. 1:**

**(1) Supply and delivery of Plants and Equipments including Mandatory Spares from abroad including Local Transportation, Insurance and other Incidental services (including port clearance etc.)**

Project	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal)		Remarks
		Quantity	Unit	F/C (USD)		
Item No.	Description	Quantity	Unit	Unit Rate 1	Amount 2	
<b>1</b>	<b>Supply of Towers including bolt and nuts, hangers, U-bolts complete</b>					
<b>1.1</b>	<b>Tower Type DB</b>					
a	Stub	176	No.			
b	Basic Body	44	No.			
c	DB -3M Leg Extension.	2	No.			
d	DB -1.5M Leg Extension.	2	No.			
e	DB +/-0M Leg Extension.	20	No.			
f	DB +1.5M Leg Extension.	4	No.			
g	DB +3M Leg Extension.	16	No.			
h	DB +4.5M Leg Extension.	4	No.			
i	DB +6M Leg Extension.	40	No.			
j	DB+7.5M Leg Extension.	8	No.			
k	DB+9 M Leg Extension.	80	No.			

<b>1.2</b>	<b>Tower Type DC</b>					
a	Stub	112	No.			
b	Basic Body	28	No.			
c	DC -3M Leg Extension.	4	No.			
d	DC -1.5M Leg Extension.	4	No.			
e	DC +/-0M Leg Extension.	20	No.			
f	DC +1.5M Leg Extension.	4	No.			
g	DC +3M Leg Extension.	8	No.			
h	DC +4.5M Leg Extension.	4	No.			
i	DC +6M Leg Extension.	28	No.			
j	DC+7.5M Leg Extension.	8	No.			
k	DC+9 M Leg Extension.	32	No.			
<b>1.3</b>	<b>Tower Type DD/DDES</b>					
a	Stub	216	No.			
b	Basic Body	54	No.			
c	DD/DDES -3M Leg Extension.	8	No.			
d	DD/DDES -1.5M Leg Extension.	8	No.			
e	DD/DDES +/-0M Leg Extension.	52	No.			
f	DD/DDES +1.5M Leg Extension.	12	No.			
g	DD/DDES +3M Leg Extension.	36	No.			
h	DD/DDES +4.5M Leg Extension.	16	No.			
i	DD/DDES +6M Leg Extension.	24	No.			
j	DD/DDES+7.5M Leg Extension.	20	No.			
k	DD/DDES+9 M Leg Extension.	40	No.			
<b>1.4</b>	<b>Tower Type DF</b>					
a	Stub	8	No.			
b	Basic Body	2	No.			
c	DF -3M Leg Extension.	0	No.			
d	DF -1.5M Leg Extension.	0	No.			
e	DF +/-0M Leg Extension.	2	No.			
f	DF +1.5M Leg Extension.	2	No.			

g	DF +3M Leg Extension.	0	No.		
h	DF +4.5M Leg Extension.	0	No.		
i	DF +6M Leg Extension.	2	No.		
j	DF+7.5M Leg Extension.	0	No.		
k	DF+9 M Leg Extension.	2	No.		
<b>2.0</b>	<b>Supply of Tower Accessories &amp; Earthing</b>				
<b>2.1</b>	<b>Tower Accessories</b>				
a	Danger Plate	128	No.		
b	Number Plate	128	No.		
c	Anti Climbing Device	128	Sets		
d	Phase Plate (set of 3)	128	Sets		
e	Circuit Plate (set of 3)	128	Sets		
f	Bird Guards	768	Sets		
g	Aviation signal	30	Sets		
<b>2.2</b>	<b>Supply of Tower Earthing Material</b>				
a	Pipe Type	128	sets		
b	Counterpoise Type				
	i) Counterpoise Type - 25 m	28	sets		
	ii) Counterpoise Type - 50 m	40	sets		
	iii) Counterpoise Type - 100 m	60	sets		
<b>3.0</b>	<b>Supply of Line Materials</b>				
<b>3.1</b>	<b>Conductor and Groundwire</b>				
a	ACSR conductor, code name "Cardinal" with armour rod, mid span compression joints, repair sleeves etc to complete the job.	245.7	km		
b	Steel ground wire with optical fiber (24 core-fiber) including intermediate splice boxes and necessary terminal splice boxes.	41	km		

<b>3.2</b>	<b>Insulator strings with insulators, attachment assemblies and arcing horns all complete for ACSR "Cardinal" conductor and attachment assemblies all complete for OPGW</b>					
a	Single suspension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	Set			
b	Double suspension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	Set			
c	Single tension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	1200	Set			
d	Double tension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	336	Set			
e	Jumper set with pilot insulators, armour rod & suitable counter weight complete with all accessories for one tower	128	Set			
f	OPGW suspension preformed assembly complete for one tower	0	Set			
g	OPGW tension preformed assembly complete for one tower (one set/tower)	40	Set			
<b>3.3</b>	<b>Preformed fittings for OPGW</b>					
a	Optical approach cable for Khungri and Ghorahi Substation.	2	Km			
b	Optical Distribution Frames and other accessories required for connection with Multiplexer of Khungri and Ghorahi Substation.	1	Lot			

<b>3.4</b>	<b>Vibration Dampers</b>					
a	Stockbridge Vibration damper for CARDINAL Conductor with preformed armour rods	1536	set			
b	Stockbridge Vibration damper for OPGW overhead ground wire with preformed armour rods	256	set			
	<b>SPARE PARTS</b>					
<b>4.0</b>	<b>Galvanized steel tower with required extension including Stubs</b>					
4.1	Tower type DA+9	0	nos.			
4.2	Tower type DB+9	1	nos.			
4.3	Tower type DC+9	1	nos.			
4.4	Tower type DD/DDES+9	1	nos.			
4.5	Tower type DF+9	1	nos.			
<b>5.0</b>	<b>Insulator strings with insulators, attachment assemblies and arcing horns all complete for ACSR "Cardinal" conductor and attachment assemblies all complete for OPGW</b>					
5.1	Single suspension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	sets			
5.2	Double suspension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	sets			
5.3	Single tension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	18	sets			



5.4	Double tension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	6	sets			
5.5	Jumper set with pilot insulators, armour rod & suitable counter weight complete with all accessories for one tower	0	sets			
5.6	OPGW suspension preformed assembly complete for one tower	0	sets			
5.7	OPGW tension preformed assembly complete for one tower (one set/tower)	3	sets			
<b>6.0</b>	<b>Conductor and accessories</b>					
6.1	Mid span compression sleeves for ACSR "CARDINAL" conductor	100	nos.			
6.2	Repair sleeve for ACSR "CARDINAL" conductor	100	nos.			
6.3	Stockbridge Vibration Damper for ACSR "CARDINAL"	120	nos.			
<b>7.0</b>	<b>Overhead OPGW and accessories</b>					
7.1	Mid span compression sleeve for OPGW	6	nos.			
7.2	Repair sleeve for OPGW	6	nos.			
7.3	Optical fiber ground wire	1	km			
7.4	Optical approach cable	1	km			
7.5	Vibration Damper for OPGW	12	set			
<b>8.0</b>	<b>TOOLS AND EQUIPMENT</b>					
8.1	Flat wrench for different size of bolts	4	sets			
8.2	Pipe wrench for common bolts	4	sets			



8.3	Come along clamp for CARDINAL conductor	6	sets			
8.4	Come along clamp for OPGW	4	nos.			
8.5	Torque Wrench for different size of bolts	6	sets			
8.6	Safety belt	12	sets			
8.7	Portable Hydraulically operated Crimping tools with 2 sets of dies each for Conductor "CARDINAL", "BEAR", "DOG", "PANTHER", "WOLF", "DUCK" & OPGW	1	sets			
8.8	Safety helmet	12	sets			
8.9	Double sheeve pulley block 5 MT capacity complete with all accessories	6	sets			
8.10	Four sheeve pulley block 10 MT capacity complete with all accessories	2	sets			
8.11	Sagging Winch Machine 10 MT capacity	1	sets			
8.12	Earth discharge rod	6	set			
8.13	132 kV Line Tester	1	set			
8.14	Earth resistance tester, battery operated with measuring range 0-1000 ohms minimum, complete with accessories	1	set			
8.15	Earth Resistivity Tester	1	Set			
8.16	Steel ropes (Pilot wire) 35 sq. mm	500	m			
8.17	Rubber covered rollers, pullies (2,3 keys)	6	sets			
8.18	Line operator's leather gloves	6	pairs			
8.19	Insulation tester (10000 V) suitable for outdoor line testing purpose	1	No.			
	<b>Total of Schedule No.1. to Grand Summary)</b>					

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

**Price Schedule for Schedule No. 2:**

**(1) Supply and delivery of Plants and Equipments including Mandatory Spares within Nepal including Local Transportation, Insurance and other Incidental services (including port clearance etc.)**

Project	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal)		Remarks
		Quantity	Unit	F/C (USD)		
Item No.	Description	Quantity	Unit	Unit Rate 1	Amount 2	
<b>1</b>	<b>Supply of Towers including bolt and nuts, hangers, U-bolts complete</b>					
<b>1.1</b>	<b>Tower Type DB</b>					
a	Stub	176	No.			
b	Basic Body	44	No.			
c	DB -3M Leg Extension.	2	No.			
d	DB -1.5M Leg Extension.	2	No.			
e	DB +/-0M Leg Extension.	20	No.			
f	DB +1.5M Leg Extension.	4	No.			
g	DB +3M Leg Extension.	16	No.			
h	DB +4.5M Leg Extension.	4	No.			

i	DB +6M Leg Extension.	40	No.			
j	DB+7.5M Leg Extension.	8	No.			
k	DB+9 M Leg Extension.	80	No.			
<b>1.2</b>	<b>Tower Type DC</b>					
a	Stub	112	No.			
b	Basic Body	28	No.			
c	DC -3M Leg Extension.	4	No.			
d	DC -1.5M Leg Extension.	4	No.			
e	DC +/-0M Leg Extension.	20	No.			
f	DC +1.5M Leg Extension.	4	No.			
g	DC +3M Leg Extension.	8	No.			
h	DC +4.5M Leg Extension.	4	No.			
i	DC +6M Leg Extension.	28	No.			
j	DC+7.5M Leg Extension.	8	No.			
k	DC+9 M Leg Extension.	32	No.			
<b>1.3</b>	<b>Tower Type DD/DDES</b>					
a	Stub	216	No.			
b	Basic Body	54	No.			
c	DD/DDES -3M Leg Extension.	8	No.			
d	DD/DDES -1.5M Leg Extension.	8	No.			
e	DD/DDES +/-0M Leg Extension.	52	No.			
f	DD/DDES +1.5M Leg Extension.	12	No.			
g	DD/DDES +3M Leg Extension.	36	No.			
h	DD/DDES +4.5M Leg Extension.	16	No.			
i	DD/DDES +6M Leg Extension.	24	No.			
j	DD/DDES+7.5M Leg Extension.	20	No.			
k	DD/DDES+9 M Leg Extension.	40	No.			
<b>1.4</b>	<b>Tower Type DF</b>					
a	Stub	8	No.			
b	Basic Body	2	No.			
c	DF -3M Leg Extension.	0	No.			

d	DF -1.5M Leg Extension.	0	No.		
e	DF +/-0M Leg Extension.	2	No.		
f	DF +1.5M Leg Extension.	2	No.		
g	DF +3M Leg Extension.	0	No.		
h	DF +4.5M Leg Extension.	0	No.		
i	DF +6M Leg Extension.	2	No.		
j	DF+7.5M Leg Extension.	0	No.		
k	DF+9 M Leg Extension.	2	No.		
<b>2.0</b>	<b>Supply of Tower Accessories &amp; Earthing</b>				
<b>2.1</b>	<b>Tower Accessories</b>				
a	Danger Plate	128	No.		
b	Number Plate	128	No.		
c	Anti Climbing Device	128	Sets		
d	Phase Plate (set of 3)	128	Sets		
e	Circuit Plate (set of 3)	128	Sets		
f	Bird Guards	768	Sets		
g	Aviation signal	30	Sets		
<b>2.2</b>	<b>Supply of Tower Earthing Material</b>				
a	Pipe Type	128	sets		
b	Counterpoise Type				
	i) Counterpoise Type - 25 m	28	sets		
	ii) Counterpoise Type - 50 m	40	sets		
	iii) Counterpoise Type - 100 m	60	sets		
<b>3.0</b>	<b>Supply of Line Materials</b>				
<b>3.1</b>	<b>Conductor and Groundwire</b>				
a	ACSR conductor, code name "Cardinal" with armour rod, mid span compression joints, repair sleeves etc to complete the job.	245.7	km		
b	Steel ground wire with optical fiber (24 core-fiber) including intermediate splice boxes and necessary terminal splice boxes.	41	km		



<b>3.2</b>	<b>Insulator strings with insulators, attachment assemblies and arcing horns all complete for ACSR "Cardinal" conductor and attachment assemblies all complete for OPGW</b>					
a	Single suspension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	Set			
b	Double suspension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	Set			
c	Single tension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	1200	Set			
d	Double tension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	336	Set			
e	Jumper set with pilot insulators, armour rod & suitable counter weight complete with all accessories for one tower	128	Set			
f	OPGW suspension preformed assembly complete for one tower	0	Set			
g	OPGW tension preformed assembly complete for one tower (one set/tower)	40	Set			
<b>3.3</b>	<b>Preformed fittings for OPGW</b>					
a	Optical approach cable for Khungri and Ghorahi Substation.	2	Km			

b	Optical Distribution Frames and other accessories required for connection with Multiplexer of Khungri and Ghorahi Substation.	1	Lot			
<b>3.4 Vibration Dampers</b>						
a	Stockbridge Vibration damper for CARDINAL Conductor with preformed armour rods	1536	set			
b	Stockbridge Vibration damper for OPGW overhead ground wire with preformed armour rods	256	set			
<b>SPARE PARTS</b>						
<b>4.0 Galvanized steel tower with required extension including Stubs</b>						
4.1	Tower type DA+9	0	nos.			
4.2	Tower type DB+9	1	nos.			
4.3	Tower type DC+9	1	nos.			
4.4	Tower type DD/DDES+9	1	nos.			
4.5	Tower type DF+9	1	nos.			
<b>5.0 Insulator strings with insulators, attachment assemblies and arcing horns all complete for ACSR "Cardinal" conductor and attachment assemblies all complete for OPGW</b>						
5.1	Single suspension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	sets			
5.2	Double suspension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	sets			

5.3	Single tension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	18	sets			
5.4	Double tension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	6	sets			
5.5	Jumper set with pilot insulators, armour rod & suitable counter weight complete with all accessories for one tower	0	sets			
5.6	OPGW suspension preformed assembly complete for one tower	0	sets			
5.7	OPGW tension preformed assembly complete for one tower (one set/tower)	3	sets			
<b>6.0</b>	<b>Conductor and accessories</b>					
6.1	Mid span compression sleeves for ACSR "CARDINAL" conductor	100	nos.			
6.2	Repair sleeve for ACSR "CARDINAL" conductor	100	nos.			
6.3	Stockbridge Vibration Damper for ACSR "CARDINAL"	120	nos.			
<b>7.0</b>	<b>Overhead OPGW and accessories</b>					
7.1	Mid span compression sleeve for OPGW	6	nos.			
7.2	Repair sleeve for OPGW	6	nos.			
7.3	Optical fiber ground wire	1	km			
7.4	Optical approach cable	1	km			
7.5	Vibration Damper for OPGW	12	set			
<b>8.0</b>	<b>TOOLS AND EQUIPMENT</b>					



8.1	Flat wrench for different size of bolts	4	sets			
8.2	Pipe wrench for common bolts	4	sets			
8.3	Come along clamp for CARDINAL conductor	6	sets			
8.4	Come along clamp for OPGW	4	nos.			
8.5	Torque Wrench for different size of bolts	6	sets			
8.6	Safety belt	12	sets			
8.7	Portable Hydraulically operated Crimping tools with 2 sets of dies each for Conductor "CARDINAL", "BEAR", "DOG", "PANTHER", "WOLF", "DUCK" & OPGW	1	sets			
8.8	Safety helmet	12	sets			
8.9	Double sheeve pulley block 5 MT capacity complete with all accessories	6	sets			
8.10	Four sheeve pulley block 10 MT capacity complete with all accessories	2	sets			
8.11	Sagging Winch Machine 10 MT capacity	1	sets			
8.12	Earth discharge rod	6	set			
8.13	132 kV Line Tester	1	set			
8.14	Earth resistance tester, battery operated with measuring range 0-1000 ohms minimum, complete with accessories	1	set			
8.15	Earth Resistivity Tester	1	Set			
8.16	Steel ropes (Pilot wire) 35 sq. mm	500	m			
8.17	Rubber covered rollers, pullies (2,3 keys)	6	sets			
8.18	Line operator's leather gloves	6	pairs			
8.19	Insulation tester (10000 V) suitable for outdoor line testing purpose	1	No.			
	<b>Total of Schedule No.2. to Grand Summary)</b>					

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

Price Schedule for Schedule No. 3: Design services.

Project :	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		Prototype Testing		Remarks
				(Excluding Taxes)		
				L/C(NRs)		
Item No.	Description	Quantity	Unit	Unit Rate	Amount	
1	Design of Tower Type DB, DC, DD and Special Tower structures as required and associated Foundation Works	1	lot			
	Total of Schedule No.3. to Grand Summary)					

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

**Price Schedule for Schedule 4: (a) Construction, Installation, Testing and commissioning works.**

Project :	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		Construction & Installation		Remarks
				(Excluding Taxes)		
				L/C		
Item No.	Description	Quantity	Unit	Unit Rate	Amount	
<b>1</b>	<b>Survey</b>				<b>1</b>	
a	Check survey and review of profile including L/R profile in undulation, tower spotting, staking of tower locations and survey on tower location where required.	39.00	Km.			
b	Detail Survey and associated works at few locations.	15.00	Km.			
c	Preparation of Land Parcel data for tower pad and ROW lands	1.00	Set			
<b>2</b>	<b>Soil Investigation</b>					
a	All kinds of Soils except fissured rock & hard rock	35	Loc.			
b	Fissured Rock (Both dry and wet)	45	Loc.			
c	Hard Rock	15	Loc.			
d	River Crossing	5	Loc.			
e	Furnishing Bore Log Data	28	Loc.			
f	Measurement of ground resistance	128	Loc.			
<b>3</b>	<b>Benching</b>					
a	Normal Soil	10000	Cum.			
b	Fissured Rock	7000	Cum.			
c	Hard Rock	500	Cum.			

<b>4</b>	<b>Erection of towers &amp; its body extensions (Complete) including bolts &amp; nuts, tack welding and supply and application of enamel &amp; zinc rich paint</b>				
<b>4.1</b>	<b>Tower Type DB</b>				
a	Stub	176	No.		
b	Basic Body	44	No.		
d	DB -3M Leg Extension.	2	No.		
e	DB -1.5M Leg Extension.	2	No.		
f	DB +/-0M Leg Extension.	20	No.		
g	DB +1.5M Leg Extension.	4	No.		
h	DB +3M Leg Extension.	16	No.		
i	DB +4.5M Leg Extension.	4	No.		
j	DB +6M Leg Extension.	40	No.		
k	DB+7.5M Leg Extension.	8	No.		
l	DB+9 M Leg Extension.	80	No.		
<b>4.2</b>	<b>Tower Type DC</b>				
a	Stub	112	No.		
b	Basic Body	28	No.		
d	DC -3M Leg Extension.	4	No.		
e	DC -1.5M Leg Extension.	4	No.		
f	DC +/-0M Leg Extension.	20	No.		
g	DC +1.5M Leg Extension.	4	No.		
h	DC +3M Leg Extension.	8	No.		
i	DC +4.5M Leg Extension.	4	No.		
j	DC +6M Leg Extension.	28	No.		
k	DC+7.5M Leg Extension.	8	No.		
l	DC+9 M Leg Extension.	32	No.		
<b>4.3</b>	<b>Tower Type DD/DDES</b>				
a	Stub	216	No.		

b	Basic Body	54	No.			
d	DD/DDES -3M Leg Extension.	8	No.			
e	DD/DDES -1.5M Leg Extension.	8	No.			
f	DD/DDES +/-0M Leg Extension.	52	No.			
g	DD/DDES +1.5M Leg Extension.	12	No.			
h	DD/DDES +3M Leg Extension.	36	No.			
i	DD/DDES +4.5M Leg Extension.	16	No.			
j	DD/DDES +6M Leg Extension.	24	No.			
k	DD/DDES+7.5M Leg Extension.	20	No.			
l	DD/DDES+9 M Leg Extension.	40	No.			
<b>4.4</b>	<b>Tower Type DF</b>					
a	Stub	8	No.			
b	Basic Body	2	No.			
d	DF -3M Leg Extension.	0	No.			
e	DF -1.5M Leg Extension.	0	No.			
f	DF +/-0M Leg Extension.	2	No.			
g	DF +1.5M Leg Extension.	2	No.			
h	DF +3M Leg Extension.	0	No.			
i	DF +4.5M Leg Extension.	0	No.			
j	DF +6M Leg Extension.	2	No.			
k	DF+7.5M Leg Extension.	0	No.			
l	DF+9 M Leg Extension.	2	No.			
<b>5.0</b>	<b>Work associated with installation of tower foundations</b>					
<b>5.1</b>	<b>Tower Type DB (for all type of body and leg extensions)</b>					
a	Dry Soil	4	No.			
b	Wet Soil	8	No.			
c	Fully Submerged Soil	4	No.			
d	Dry Fissured Rock	12	No.			

e	Wet Fissured Rock	12	No.			
f	Submerged Fissured Rock	0	No.			
g	Hard Rock	4	No.			
<b>5.2</b>	<b>Tower Type DC (for all type of body and leg extensions)</b>					
a	Dry Soil	2	No.			
b	Wet Soil	12	No.			
c	Fully Submerged Soil	2	No.			
d	Dry Fissured Rock	3	No.			
e	Wet Fissured Rock	8	No.			
f	Submerged Fissured Rock	0	No.			
g	Hard Rock	1	No.			
<b>5.3</b>	<b>Tower Type DD/DDES (for all type of body and leg extensions)</b>					
a	Dry Soil	6	No.			
b	Wet Soil	12	No.			
c	Fully Submerged Soil	6	No.			
d	Dry Fissured Rock	10	No.			
e	Wet Fissured Rock	16	No.			
f	Submerged Fissured Rock	0	No.			
g	Hard Rock	4	No.			
<b>5.4</b>	<b>Tower Type DF (for all type of body and leg extensions)</b>					
a	Dry Soil	0	No.			
b	Wet Soil	2	No.			
c	Fully Submerged Soil	0	No.			
d	Dry Fissured Rock	0	No.			
e	Wet Fissured Rock	0	No.			
f	Submerged Fissured Rock	0	No.			
g	Hard Rock	0	No.			

<b>5.5</b>	<b>Raised chimney type foundation installation for all type of tower locations all complete.</b>					
a	M20 Conc. Nominal Mix 1:1.5:3 for raised chimney work.	150	CUM			
b	Reinforcement Bars for raised chimney foundation	50	tons			
<b>6.0</b>	<b>Installation of Tower Accessories &amp; Earthing</b>					
<b>6.1</b>	<b>Tower Accessories</b>					
a	Danger Plate	128	No.			
b	Number Plate	128	No.			
c	Anti-Climbing Device	128	Sets			
d	Phase Plate (set of 3)	128	Sets			
e	Circuit Plate (set of 3)	128	Sets			
f	Bird Guards	768	Sets			
f	Aviation signal	30	Sets			
<b>6.2</b>	<b>Installation of Tower Earthing Material</b>					
a	Pipe Type	128	sets			
b	Counterpoise Type					
	i) Counterpoise Type - 25 m	28	sets			
	ii) Counterpoise Type - 50 m	40	sets			
	iii) Counterpoise Type - 100 m	60	sets			
<b>7.0</b>	<b>Installation of Line Materials</b>					
<b>7.1</b>	<b>Stringing of Conductor and Groundwire</b>					
a	Stringing of 39 km, 132 kV double circuit transmission line ACSR conductor, code name "Cardinal" with armour rod, mid span compression joints, repair sleeves etc to complete the job	39	km			
b	Stringing of 39 km, steel ground wire with optical fiber (24-fiber) including intermediate splice boxes and necessary terminal splice boxes, etc.	39	km			

<b>7.2</b>	<b>Insulator strings with insulators, attachment assemblies and arcing horns all complete for ACSR "Cardinal" conductor and attachment assemblies all complete for OPGW</b>				
a	Single suspension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	Set		
b	Double suspension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	0	Set		
c	Single tension with 1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	1200	Set		
d	Double tension with 2x1 composite long rod insulator complete for "Cardinal" conductor suitable for altitude above 1,000 m	336	Set		
e	Jumper set with pilot insulators, armour rod & suitable counter weight complete with all accessories for one tower	128	Set		
f	OPGW suspension preformed assembly complete for one tower	0	Set		
g	OPGW tension preformed assembly complete for one tower (one set/tower)	40	Set		
<b>7.3</b>	<b>Installation of Preformed fittings for OPGW</b>				
a	Optical approach cable for Khungri and Ghorahi Substation.	2	Km		
b	Optical Distribution Frames and other accessories required for connection with Multiplexer of Khungri and Ghorahi Substation.	1	Lot		
<b>7.4</b>	<b>Installation of Vibration Dampers</b>	0			
a	Vibration Dampers for ACSR "CARDINAL"	1536	set		
b	Vibration Dampers for OPGW	256	set		
<b>8.0</b>	<b>Protection of tower footing</b>				
a	Random rubble stone masonry including excavation (1:4 cement: sand)	4000	CUM		
b	Stone bound in galvanizing wire netting including excavation (Gabion box protection)	12000	CUM		
c	Back filling and leveling of volumes enclosed by revetment	8000	CUM		
d	M20 Conc. Nominal Mix 1:1.5:3 for protection work.	1000	CUM		



e	Reinforcement Bars	100	tons			
f	Ground Handling cost during crossing with probable existing Line Near substation using suitable alternatives	1	LS			
<b>9.0</b>	<b>Supply of all necessary materials, erection and installation of 11 kV D/C line using dog conductor to feed Khungri local area from Khungri SS 11 kV bay as per specification all complete.</b>	4	km			
<b>Total of Schedule No.4 (a). to Grand Summary)</b>						

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

**Price Schedule for Schedule No. 4(b) : Training services to be imparted abroad**

Project :	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		Total Price		Remarks
				F/C(US \$)		
Item No.	Description	Quantity	Unit	Unit Rate	Amount	
<b>1</b>	<b>Training Charges for the trainings to be imparted abroad to Employers personnels</b>					
a	PLC Cadd training to four personnel's of employer (7 days) with the objective to produce the final tower spotting and scheduling of the line route of this Project.	1	lot			
b	PLC tower training to four personnels of employer (7 days) with the objective to enhance the trainees to assess the tower design report of the tower designs of this Project.	1	lot			
	<b>Total of Schedule No.4 (b). to Grand Summary)</b>					

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

Price Schedule for Schedule No. 4(c) : Training Charges for training to be imparted to Employer's Personnel by Bidder's Instructor in Nepal

Project :	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		Total Price		Remarks
				L/C(NRs)		
Item No.	Description	Quantity	Unit	Unit Rate	Amount	
1	NOT APPLICABLE					
	Total of Schedule No.4 (c). to Grand Summary)					

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

**Price Schedule for Price Schedule No. 4(d) : Maintenance Charge**

Project :	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		Total Price		Remarks
				L/C(NRs)		
Item No.	Description	Quantity	Unit	Unit Rate	Amount	
1	NOT APPLICABLE					
	Total of Schedule No.4 (d). to Grand Summary)					

**Nepal Electricity Authority**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**

**Price Schedule for Price Schedule No. 4 (e): Proto Type Testing of Towers**

Project :	GHORAH-MADICHAUR TRANSMISSION LINE PROJECT	Estimated		Prototype Testing		Remarks
				(Excluding Taxes)		
				L/C(NRs)		
Item No.	Description	Quantity	Unit	Unit Rate	Amount	
<b>1</b>	<b>Proto Type Testing of Towers</b>					
a	Tower Type DB with extension +9m	1	no.			
b	Tower Type DC with extension +9m	1	no.			
c	Tower Type DD/ DDES with extension +9m	1	no.			
	<b>Total of Schedule No.5. to Grand Summary)</b>					

# Khungri Substation



## NEPAL ELECTRICITY AUTHORITY

### Project Management Directorate

#### Ghorahi-Madichaur 132 kV Transmission Line Project

#### Price Schedule for Khungri Substation

F/C : Foreign Currency (USD)

L/C : Local Currency (NRs.)

#### Grand Summary

S.No.	DESCRIPTION	TOTAL AMOUNT	
		F/C ( US \$ )	L/C ( NRs )
1	<b>Schedule No.1:</b> Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, clearing, forwarding and transportation up to site.		
2	<b>Schedule No.2:</b> Plant and Equipment (including Mandatory Spares Parts) Supplied within Nepal including Insurance, clearing, forwarding and transportation up to site.		
	<b>SUB-TOTAL OF SUPPLY</b>		
3	<b>Schedule No.3:</b> Design Services		
4	<b>Schedule No.4:</b>		
	a) Construction, Installation, Testing and Commissioning Services		
	b) Training Charges for training to be imparted abroad		
	c) Training Charges for training to be imparted in Nepal		
	d) Maintenance Charge		
	<b>TOTAL</b>		



**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Khungri Substation**

**Schedule No.1:- Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Unit	Quantity	CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal )	
				Unit Rate US\$	Amount US\$
		(1)	(2)	(3)	(4) = (2) x (3)
<b>A)</b>	<b>ELECTRICAL WORKS</b>				
<b>a)</b>	<b>POWER TRANSFORMER</b>				
1.0	30 MVA, 132/33 kV, three phase, power transformer complete with on load tap changer (OLTC), RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides ,Star/star complete with all accessories	no	1		
2.0	6/8 MVA, ONAN/ONAF, 33/11kV,three phase, power transformer complete with on load tap changer (OLTC), RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides complete with all accessories	no	1		
<b>b)</b>	<b>LT TRANSFORMER</b>				
1.0	250 kVA, 33/0.4 kV station service transformer as per technical specification and drawings	no	1		



<b>c)</b>	<b>CIRCUIT BREAKER &amp; SWITCHGEAR</b>				
1.0	145 kV, 2000 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for bus coupler)	sets	1		
2.0	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV side of power transformer & 132 kV lines)	sets	5		
3.0	36 kV, 2000 A, 25 kA, 1 sec, 3 phase, Vacuum circuit breaker for 33 kV side of power transformer complete with all accessories	sets	1		
4.0	36 kV, 1250 A, 25 kA, 1 sec, 3 phase, vacuum circuit breaker complete with all accessories	sets	6		
<b>d)</b>	<b>DISCONNECTING SWITCHES:</b>				
1.0	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch complete with all accessories as per specification.	sets	4		
2.0	145 kV, 2000 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	2		
3.0	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	10		
4.0	36 kV, 1250 A, 3 phase disconnecting switch with grounding switch complete with all accessories as per specification.	sets	5		
5.0	36 kV, 2000 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	1		
6.0	36 kV, 1250 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	6		



e)	<b>INSTRUMENT TRANSFORMERS:</b>				
1.0	145 kV, 50 VA, $132/\sqrt{3}/110/\sqrt{3}$ kV, Class 0.2/3P Voltage Transformer complete with all accessories as per specification	nos	18		
2.0	145 kV, 30 VA 5 core current transformer for Line & Bus coupler complete with all accessories as per specification	nos	15		
3.0	145 kV, 30 VA 5 core current transformer for power transformer complete with all accessories as per specification	nos	3		
4.0	36 kV, 50 VA, $33/\sqrt{3}/110/\sqrt{3}$ V potential transformer complete with all accessories as per specification	nos	18		
5.0	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification	nos	3		
6.0	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	18		
f)	<b>LIGHTNING ARRESTORS:</b>				
1.0	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	15		
2.0	30 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	21		
3.0	9 kV Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	6		
g)	<b>CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)</b>				
1.0	132/33 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1		

2.0	33/11 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1		
3.0	132 kV Bus bar/ Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1		
4.0	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	4		
5.0	33 kV line control and relay panel complete with all accessories as per technical specifications	sets	4		
<b>h)</b>	<b>CABLES ALONG WITH CLAMPS, GLANDS, LUGS ETC.</b>				
1.0	132 kV 1000 sq. mm single core XLPE power cable with all accessories and termination equipments in both ends to complete the scope of work.	Meter	500		
2.0	11 kV HT Copper Cable (1CX400 SQ.mm, two cable per phase) for 11 kV side of 33/11 kV transformer along with accessories and termination equipments in both ends.	Meter	550		
3.0	11 kV HT armored Cable 3C, 300 Sq.mm Aluminum along with accessories and termination equipments for both ends with double pole structure for two outgoing 11 kV feeder line	Meter	800		
4.0	11 kV HT 3C, 50 Sq.mm Aluminum Cable along with accessories and termination equipments both ends for termination of 11 kV LT Transformer	LS	1		
5.0	0.4 kV HT Aluminum Cable (3.5 C, 300 Sq. mm) for 0.4 kV side of 33/0.4 kV LT transformer along with accessories and termination equipments for AC Distribution Panel	LS	1		
6.0	33 kV HT armored Copper Cable (1CX240 SQmm) for 5 nos of 33 kV feeder line along with accessories including flexible pipe and termination equipments and structure at both end	Meter	1200		
7.0	<b>Power Cables - (1.1 kV grade)</b>				

7.1	Required size of Power/ Control copper cable for switchyard, control room and communication purpose and others if any to complete the work as per specification.	LS	1		
7.2	Required size of Power/ Control copper cable for staff quarter building parking shade, playing court as main supply and others if any to complete the work as per specification.	LS	1		
7.3	Cable glands, lugs for Power & Control cables	LS	1		
<b>i)</b>	<b>Grounding</b>				
1.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories	LS	1		
2.0	Lightning protection system with lightning mast, copper conductor, electrodes complete with all accessories for control building	LS	1		
3.0	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1		
<b>j)</b>	<b>BATTERIES AND BATTERY CHARGER</b>				
1.0	Float cum boost battery charger for 110 V battery (45A/45A) complete with all accessories	Nos	2		
2.0	Float cum boost battery charger for 48 V battery (45A/45A) complete with all accessories	Nos	2		
3.0	110 V, 600 AH batteries complete with all accessories	sets	1		
4.0	48 V, 300 AH batteries complete with all accessories	sets	1		
<b>k)</b>	<b>Bus post Insulator:</b>				
1.0	132 kV Bus post insulators	nos	60		

2.0	33 kV Bus post insulators	nos	30		
<b>1)</b>	<b>ERECTION &amp; MISCELLANEOUS MATERIALS</b>				
1.0	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower.	lot	1		
2.0	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1		
3.0	33 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line pole.	lot	1		
4.0	33 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line pole	lot	1		
5.0	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1		
6.0	Main tubular bus (for 33 bus bar), branch bus bar (for 132 kV) including branch bus bar for 33 kV and other accessories required to complete the job	LS	1		
7.0	33 kV distribution line Material for double circuit (13 mtr Galvanized Steel Tubular Pole, Conductor ACSR 'DOG', Insulators, galvanized cross arms, angle for bracing, spandle, bracing angle, flat strip, I & U bolt, nut & bolts etc) including stay set to complete the specified scope of the work as per NEA standards	KM	2		
8.0	<b>Air conditioning System:</b>				
8.1	Ceiling cassette type split AC unit of 3 TR capacities including ceiling cassette type for 132 kV control room	Nos	4		

8.2	High wall type split AC unit of 2 TR capacities for 11 kV switchgear room	Nos	3		
8.3	High wall type split AC unit of 1.5 TR capacities for communication, battery, office room and staff quarter building	Nos	9		
9.0	<b>Fire Protection System (Portable Trolley Wheel mounted extinguishers)</b>				
9.1	30 litre foam type	Nos	4		
9.2	4.5 kg CO2 type	Nos	9		
9.3	22.5 kg Dry Chemical Powder (DCP) type	Nos	4		
9.4	Smoke detection system	LS	1		
9.5	Fire detection and Alarm System for control room	LS	1		
10.0	<b>Identification plate, danger notice etc</b>	LS	1		
<b>m)</b>	<b>LT Switchgear (As per Technical specification)</b>				
1.0	400 V AC Main switchboard panel	Sets	1		
2.0	110 V DCDB	Sets	1		
3.0	48 V DCDB	Sets	1		
<b>n)</b>	<b>12 KV VCB Switchgear Panel with all accessories as per specified</b>				
1.0	12 kV Transformer incomer module (2000A) (IP-2) with all accessories as per specification	Sets	1		
2.0	12 kV Outgoing Line Module (1250A) (IP-1) with all accessories as per specification	Sets	4		
3.0	12 kV PT module (IP-3) with all accessories as per specification	Sets	1		

<b>o)</b>	<b>Illumination System</b>				
1.0	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary ) as per technical specification	LS	1		
2.0	Emergency DC lighting system complete for switchyard	Nos	12		
	<b>SUB TOTAL OF ELECTRIC EQUIPMENTS</b>				
<b>B)</b>	<b><i>SUBSTATION AUTOMATION/ COMMUNICATION / SCADA (Based on IEC 61850)</i></b>				
<b>a)</b>	<b>SUBSTATION AUTOMATION SYSTEM:</b>				
1.0	<b>Complete Substation automation system including hardware and software for the substation &amp; remote control stations alongwith associated equipments for the followings as per Technical Specification.</b>				
1.1	132 kV System	Bays	6		
1.2	33 kV System	Bays	6		
1.3	11 kV System ( Indoor Switchgear)	Bays	2		
2.0	Integration of all 132/33/11kV Bays under present scope with the SCADA of SIEMENS (Power 7) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1		
<b>b)</b>	<b>RTU INTEGRATION AT GHORAH S/S</b>				
<b>(i)</b>	Necessary extension, reorientation, reconfiguration and adaptation of existing RTU including supply of necessary cards, cables, connectors and other hardware and software required for data transmission and remote operation of new 132 kV bays	LS	1		

(ii)	Integration of all 132kV Bays under present scope with the SCADA of SIEMENS (Power 7) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1		
<b>3.0</b>	<b>COMMUNICATION AND SCADA</b>				
3.1	Digital Protection Coupler	nos	4		
<b>3.2 (A)</b>	<b>Telecommunication equipments for Khungri S/S</b>				
<b>3.2.1.A</b>	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)				
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equipped to complete function as per requirement in specification excluding (ii) & (iii) below	LS	1		
(ii)	Optical Interface Cards/ SFP				
(a)	L4.2 SFP	Nos.	2		
(iii)	Tributary cards				
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2		
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
3.2.2. A	<b>Equipment Cabinets</b>	No.	1		
3.2.3.A	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2		
<b>3.2 (B)</b>	<b>Telecommunication equipments for Ghorahi S/S</b>				
3.2.1.B	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)				



(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equipped to complete function as per requirement in specification excluding (ii) & (iii) below	LS	1		
(ii)	Optical Interface Cards/SFP				
(a)	L4.1 SFP	Nos.	4		
(b)	L4.2 SFP	Nos.	2		
(iii)	Tributary cards				
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2		
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
3.2.2. B	Equipment Cabinets	No.	1		
3.2.3.B	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2		
	<b>SUB TOTAL OF COMMUNICATION &amp; SAS EQUIPMENTS</b>				
<b>C)</b>	<b>CIVIL WORKS</b>				
<b>1.0</b>	<b>Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, gusset plates and all accessories: (For 132 and 33 kV side)</b>				
1.1	132 kV take off gantry structures	LS	1		
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure	LS	1		
1.3	145 kV SF6 circuit breaker	sets	6		



1.4	145 kV disconnecting switch with earth switch	sets	4		
1.5	145 kV disconnecting switch without earth switch	sets	12		
1.6	132 kV voltage transformer	nos	18		
1.7	132 kV current transformer	nos	18		
1.8	120 kV surge arrester	nos	15		
1.9	132 kV Bus post insulator	no.	60		
1.10	132 kV Double circuit dead end galvanized lattice tower as per employer provided tested drawings	no.	1		
1.11	33 kV take off gantry structures	LS	1		
1.12	33 kV internal gantry structures	LS	1		
1.13	36 kV vacuum circuit breaker	sets	7		
1.14	33 kV disconnecting switch with earth switch	sets	5		
1.15	33 kV disconnecting switch without earth switch	sets	7		
1.16	33 kV voltage transformer	nos	18		
1.17	33 kV current transformer	nos	21		
1.18	30 kV surge arrester	nos	21		
1.19	33 kV Bus post insulator	no.	30		
1.20	Rail Structure for 132/33 Power Transformer including access from inter road (For transformer shifting)	LS	1		
1.21	Lightning/ Earth Mast	Set	2		
	<b>SUB TOTAL OF STEEL STRUCTURES</b>				
<b>D)</b>	<b>SPARE PARTS</b>				
<b>1.0</b>	<b>Transformer</b>				

<b>a)</b>	<b>132/33 kV Transformer:</b>				
1.0	OLTC motor with contactor	sets	1		
2.0	Cooler Fan with motor	nos	1		
3.0	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1		
4.0	Buchholz relay complete with contacts (Main tank)	sets	1		
5.0	Magnetic oil level gauge	nos	1		
6.0	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1		
7.0	Complete set of pressure relief device	set	1		
8.0	145 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
9.0	36 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
10.0	Spare insulating oil to be handed over to NEA after commissioning for O&M requirement including tank	KL	15		
<b>b)</b>	<b>33/ 11 kV Transformer</b>				
1.0	OLTC motor with contactor	sets	1		
2.0	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1		
3.0	Buchholz relay complete with contacts (Main tank)	sets	1		
4.0	Magnetic oil level gauge	nos	1		
5.0	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1		
6.0	Complete set of pressure relief device	set	1		
7.0	36 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
8.0	11 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
<b>2.0</b>	<b>145 KV SF6 CIRCUIT BREAKER:</b>				



2.1	Complete set of interrupting chamber	set	1		
2.2	Rubber gaskets, `O' rings and seals for SF6 gas (1 No. of each type)	sets	1		
2.3	Trip coil assembly with resistor as applicable	sets	3		
2.4	Closing coil assembly with resistor as applicable	sets	3		
2.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1		
2.6	Gas filling equipment with accessories	sets	1		
2.7	Motor for mechanism	nos	1		
<b>3.0</b>	<b>33 KV VACCUME CIRCUIT BREAKER:</b>				
3.1	Complete set of interrupting chamber	set	1		
3.2	Rubber gaskets, `O' rings and seals (1 No. of each type)	sets	1		
3.3	Trip coil assembly with resistor as applicable	sets	3		
3.4	Closing coil assembly with resistor as applicable	sets	3		
3.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1		
3.6	Motor for mechanism	nos	1		
<b>4.0</b>	<b>145 KV ISOLATORS :</b>				
4.1	Porcelain insulators	nos	3		
4.2	Main contact assemblies (one assembly)	sets	3		
4.3	Auxiliary contact assemblies (one assembly)	sets	3		
4.4	Interlocking coil	sets	2		
4.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1		

4.6	Limit switch and Aux. Switches for complete 3 phase equipment				
4.6.1	For isolator	sets	1		
4.6.2	For earth switch	sets	1		
<b>5.0</b>	<b>33 KV ISOLATORS :</b>				
5.1	Porcelain insulators	nos	3		
5.2	Main contact assemblies (one assembly)	sets	3		
5.3	Auxiliary contact assemblies (one assembly)	sets	3		
5.4	Interlocking coil	sets	2		
5.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1		
5.6	Limit switch and Aux. Switches for complete 3 phase equipment				
5.6.1	For isolator	sets	1		
5.6.2	For earth switch	sets	1		
<b>6.0</b>	<b>145 KV Instrument Transformer:</b>				
6.1	132 kV Current transformer (excluding support structure and common JB) for transformer	no	1		
6.2	132 kV Current transformer (excluding support structure and common JB) for line and bus coupler	no	2		
6.3	132kV, VT (excluding support structure/ common JB)	no	2		
6.4	33 kV Current transformer (excluding support structure and common JB)	no	3		
6.5	33 kV PT (excluding support structure/ common JB)	no	2		



<b>7.0</b>	<b>AIS Surge Arrestors: (Outdoor)</b>				
7.1	120 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	2		
7.2	30 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	6		
7.3	9 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	nos	3		
<b>8.0</b>	<b>110 V Battery Chargers</b>				
8.1	Set of Control Cards	sets	1		
8.2	Set of relays	sets	1		
8.3	Rectifier transformer	nos	1		
8.4	Thyristor/ Diode	sets	1		
8.5	Fuses of Thyristor with indicators	sets	6		
9.0	<b>48V Battery Chargers</b>				
9.1	Set of Control Cards	sets	1		
9.2	Set of relays	sets	1		
9.3	Rectifier transformer	no	1		
9.4	Thyristor/ Diode	sets	1		
9.5	Fuses of Thyristor with indicators	sets	6		
10.0	<b>Relay &amp; Protection (132 kV):</b>				
10.1	<b>Line Protection Panel</b>				
10.1.1	Numerical distance relay (1 no. of each type)	set	1		

10.2	<b>Transformer Protection Panel</b>				
10.2.1	Transformer differential protection	no	1		
10.2.2	Restricted earth fault protection relay with non-linear resistor	no	1		
10.2.3	Directional over current & E/F Protection Relay	no	1		
10.3	<b>COMMON SPARES</b>				
10.3.1	Breaker failure relay	no	1		
10.3.2	Trip circuit supervision relay	nos	2		
10.3.3	Self-reset trip relay (relay of each type)	set	1		
10.3.4	Hand reset trip relay (relay of each type)	set	1		
10.3.5	Timer relay (relay of each type)	set	1		
10.3.6	DC supervision relay (relay of each type)	set	1		
10.3.7	Flag relays (relay of each type)	set	1		
10.3.8	Auxiliary relays (relay of each type)	set	1		
10.3.9	Indicating lamps of each type	nos	6		
10.3.10	Fuse of each type	nos	6		
10.3.11	Color caps of each color for indicating lamp	nos	3		
10.3.12	Ammeter	nos	2		
10.3.13	Voltmeter	nos	2		
<b>11.0</b>	<b>Relay &amp; Protection (33 kV):</b>				
11.1	<b>Line Protection Panel</b>				
11.1.1	Directional over current & E/F Protection Relay	set	1		
11.2	<b>Transformer Protection Panel</b>				



11.2.1	Transformer differential protection	no	1		
11.2.2	Restricted earth fault protection relay with non-linear resistor	no	1		
11.2.3	Directional over current & E/F Protection Relay	no	1		
11.3	<b>COMMON SPARES</b>				
11.3.1	Breaker failure relay	no	1		
11.3.2	Trip circuit supervision relay	nos	2		
11.3.3	Self-reset trip relay (relay of each type)	set	1		
11.3.4	Hand reset trip relay (relay of each type)	set	1		
11.3.5	Timer relay (relay of each type)	set	1		
11.3.6	DC supervision relay (relay of each type)	set	1		
11.3.7	Flag relays (relay of each type)	set	1		
11.3.8	Auxiliary relays (relay of each type)	set	1		
11.3.9	Indicating lamps of each type	nos	6		
11.3.10	Fuse of each type	nos	6		
11.3.11	Color caps of each color for indicating lamp	nos	3		
11.3.12	Ammeter	nos	2		
11.3.13	Voltmeter	nos	2		
<b>12.0</b>	<b>MV Indoor Switchgear (33 kV Switchgear):</b>				
12.1	33 kV Vacuum Interrupter	nos	3		
12.2	Tripping Coils	nos	3		
12.3	Closing Coils	nos	3		



12.4	Spring Charging Motor	set	1		
<b>12.5</b>	<b>Protection Relays:</b>				
12.5.1	3 phase Overcurrent Relay, for 33 kV side one of each type	nos	1		
12.5.2	Ground Fault Relay, for 33 kV side, one of each type	nos	1		
12.6	Ammeter, Nos one of each rating	nos	1		
12.70	Voltmeter	nos	1		
12.80	Indicating lamps and fuses (100% of used type), Lot	LS	1		
12.90	33 kV HT cable termination kit alongwith accessories for indoor	sets	3		
12.10	33 kV HT cable termination kit alongwith accessories for outdoor	sets	3		
<b>13.00</b>	<b>Indoor Switchgear (11 kV Switchgear):</b>				
13.10	11 kV Vacuum Interrupter	nos	3		
13.20	Tripping Coils	nos	3		
13.30	Closing Coils	nos	3		
13.40	Spring Charging Motor	set	1		
13.50	Protection Relays:				
13.5.1	3 phase Overcurrent Relay, for 11 kV side one of each type	nos	1		
13.5.2	Ground Fault Relay, for 11 kV side, one of each type	nos	1		
13.60	Ammeter, Nos one of each rating	nos	1		
13.70	Voltmeter	nos	1		
13.80	kVA Meter	nos	1		
13.90	Indicating lamps and fuses (100% of used type), Lot	LS	1		



13.10	11 kV HT cable termination kit alongwith accessories for indoor	sets	3		
13.11	11 kV HT cable termination kit alongwith accessories for outdoor	sets	3		
<b>14.0</b>	<b>Bus post Insulators:</b>				
14.10	132 kV	nos	6		
14.20	33 kV	nos	6		
<b>15.00</b>	<b>Communication and SCADA:</b>				
15.1	SDH (Cross Connect/control cards, optical base cards, power supply cards, management card)	each	1		
15.2	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
15.3	SFP L4.1	Nos.	2		
15.4	SFP L4.2	Nos.	2		
15.5	Digital Protection Coupler	Nos.	1		
<b>16.0</b>	<b>Miscellaneous:</b>				
16.1	Tonge tester as per specification	nos	1		
16.2	5 kV Insulation tester (Megger)	nos	1		
	<b>SUB TOTAL OF SPARE PARTS</b>				
<b>TOTAL OF SCHEDULE 1</b>					

**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Khungri Substation**

**Schedule No.2:- Plant and Equipment (including Mandatory Spares Parts) Supplied Within Nepal including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Unit	Quantity	CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal )	
				Unit Rate US\$	Amount US\$
		(1)	(2)	(3)	(4) = (2) x (3)
<b>A)</b>	<b><i>ELECTRICAL WORKS</i></b>				
<b>a)</b>	<b>POWER TRANSFORMER</b>				
1.0	30 MVA, 132/33 kV, three phase, power transformer complete with on load tap changer (OLTC), RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides ,Star/star complete with all accessories	no	1		
2.0	6/8 MVA, ONAN/ONAF, 33/11kV,three phase, power transformer complete with on load tap changer (OLTC), RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides complete with all accessories	no	1		
<b>b)</b>	<b>LT TRANSFORMER</b>				
1.0	250 kVA, 33/0.4 kV station service transformer as per technical specification and drawings	no	1		



<b>c)</b>	<b>CIRCUIT BREAKER &amp; SWITCHGEAR</b>				
1.0	145 kV, 2000 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for bus coupler)	sets	1		
2.0	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV side of power transformer & 132 kV lines)	sets	5		
3.0	36 kV, 2000 A, 25 kA, 1 sec, 3 phase, vacuum circuit breaker for 33 kV side of power transformer complete with all accessories	sets	1		
4.0	36 kV, 1250 A, 25 kA, 1 sec, 3 phase, vacuum circuit breaker complete with all accessories	sets	6		
<b>d)</b>	<b>DISCONNECTING SWITCHES:</b>				
1.0	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch complete with all accessories as per specification.	sets	4		
2.0	145 kV, 2000 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	2		
3.0	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch complete with all accessories as per specification.	sets	10		
4.0	36 kV, 1250 A, 3 phase disconnecting switch with grounding switch complete with all accessories as per specification.	sets	5		
5.0	36 kV, 2000 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	1		
6.0	36 kV, 1250 A, 3 phase disconnecting switch without grounding switch complete with all accessories as per specification.	sets	6		

e)	<b>INSTRUMENT TRANSFORMERS:</b>				
1.0	145 kV, 50 VA, $132/\sqrt{3}/110/\sqrt{3}$ kV, Class 0.2/3P Voltage Transformer complete with all accessories as per specification	nos	18		
2.0	145 kV, 30 VA 5 core current transformer for Line & Bus coupler complete with all accessories as per specification	nos	15		
3.0	145 kV, 30 VA 5 core current transformer for power transformer complete with all accessories as per specification	nos	3		
4.0	36 kV, 50 VA, $33/\sqrt{3}/110/\sqrt{3}$ V potential transformer complete with all accessories as per specification	nos	18		
5.0	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification	nos	3		
6.0	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	18		
f)	<b>LIGHTNING ARRESTORS:</b>				
1.0	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	15		
2.0	30 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	21		
3.0	9 kV Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	6		
g)	<b>CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)</b>				
1.0	132/33 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1		



2.0	33/11 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1		
3.0	132 kV Bus bar/ Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1		
4.0	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	4		
5.0	33 kV line control and relay panel complete with all accessories as per technical specifications	sets	4		
<b>h)</b>	<b>CABLES ALONG WITH CLAMPS, GLANDS, LUGS ETC.</b>				
1.0	132 kV 1000 sq. mm single core XLPE power cable with all accessories and termination equipments in both ends to complete the scope of work.	Meter	500		
2.0	11 kV HT Copper Cable (1CX400 SQ mm, two cable per phase) for 11 kV side of 33/11 kV transformer along with accessories and termination equipments in both ends.	Meter	550		
3.0	11 kV HT armored Cable 3C, 300 Sq.mm Aluminum along with accessories and termination equipments for both ends with double pole structure for two outgoing 11 kV feeder line	Meter	800		
4.0	11 kV HT 3C, 50 Sq.mm Aluminum Cable along with accessories and termination equipments both ends for termination of 11 kV LT Transformer	LS	1		
5.0	0.4 kV HT Aluminum Cable (3.5 C, 300 Sq. mm) for 0.4 kV side of 33/0.4 kV LT transformer along with accessories and termination equipments for AC Distribution Panel	LS	1		
6.0	33 kV HT armored Copper Cable (1CX240 SQ mm) for 5 nos of 33 kV feeder line along with accessories including flexible pipe and termination equipments and structure at both end	Meter	1200		
7.0	<b>Power Cables - (1.1 kV grade)</b>				

7.1	Required size of Power/ Control copper cable for switchyard, control room and communication purpose and others if any to complete the work as per specification.	LS	1		
7.2	Required size of Power/ Control copper cable for staff quarter building parking shade, playing court as main supply and others if any to complete the work as per specification.	LS	1		
7.3	Cable glands, lugs for Power & Control cables	LS	1		
<b>i)</b>	<b>Grounding</b>				
1.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories	LS	1		
2.0	Lightning protection system with lightning mast, copper conductor, electrodes complete with all accessories for control building	LS	1		
3.0	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1		
<b>j)</b>	<b>BATTERIES AND BATTERY CHARGER</b>				
1.0	Float cum boost battery charger for 110 V battery (45A/45A) complete with all accessories	Nos	2		
2.0	Float cum boost battery charger for 48 V battery (45A/45A) complete with all accessories	Nos	2		
3.0	110 V, 600 AH batteries complete with all accessories	sets	1		
4.0	48 V, 300 AH batteries complete with all accessories	sets	1		
<b>k)</b>	<b>Bus post Insulator:</b>				
1.0	132 kV Bus post insulators	nos	60		



2.0	33 kV Bus post insulators	nos	30		
<b>1)</b>	<b>ERECTION &amp; MISCELLANEOUS MATERIALS</b>				
1.0	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower.	lot	1		
2.0	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1		
3.0	33 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line pole.	lot	1		
4.0	33 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line pole	lot	1		
5.0	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1		
6.0	Main tubular bus (for 33 bus bar), branch bus bar (for 132 kV) including branch bus bar for 33 kV and other accessories required to complete the job	LS	1		
7.0	33 kV distribution line Material for double circuit (13 mtr Galvanized Steel Tubular Pole, Conductor ACSR 'DOG', Insulators, galvanized cross arms, angle for bracing, spandle, bracing angle, flat strip, I & U bolt, nut & bolts etc) including stay set to complete the specified scope of the work as per NEA standards	KM	2		
8.0	<b>Air conditioning System:</b>				
8.1	Ceiling cassette type split AC unit of 3 TR capacities including ceiling cassette type for 132 kV control room	Nos	4		



8.2	High wall type split AC unit of 2 TR capacities for 11 kV switchgear room	Nos	3		
8.3	High wall type split AC unit of 1.5 TR capacities for communication, battery, office room and staff quarter building	Nos	9		
9.0	<b>Fire Protection System (Portable Trolley Wheel mounted extinguishers)</b>				
9.1	30 liter foam type	Nos	4		
9.2	4.5 kg CO2 type	Nos	9		
9.3	22.5 kg Dry Chemical Powder (DCP) type	Nos	4		
9.4	Smoke detection system	LS	1		
9.5	Fire detection and Alarm System for control room	LS	1		
10.0	<b>Identification plate, danger notice etc</b>	LS	1		
<b>m)</b>	<b>LT Switchgear (As per Technical specification)</b>				
1.0	400 V AC Main switchboard panel	Sets	1		
2.0	110 V DCDB	Sets	1		
3.0	48 V DCDB	Sets	1		
<b>n)</b>	<b>12 KV VCB Switchgear Panel with all accessories as per specified</b>				
1.0	12 kV Transformer incomer module (2000A) (IP-2) with all accessories as per specification	Sets	1		
2.0	12 kV Outgoing Line Module (1250A) (IP-1) with all accessories as per specification	Sets	4		
3.0	12 kV PT module (IP-3) with all accessories as per specification	Sets	1		



<b>o)</b>	<b>Illumination System</b>				
1.0	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary ) as per technical specification	LS	1		
2.0	Emergency DC lighting system complete for switchyard	Nos	12		
	<b>SUB TOTAL OF ELECTRIC EQUIPMENTS</b>				
<b>B)</b>	<b><i>SUBSTATION AUTOMATION/ COMMUNICATION / SCADA (Based on IEC 61850)</i></b>				
<b>a)</b>	<b>SUBSTATION AUTOMATION SYSTEM:</b>				
1.0	<b>Complete Substation automation system including hardware and software for the substation &amp; remote control stations alongwith associated equipments for the followings as per Technical Specification.</b>				
1.1	132 kV System	Bays	6		
1.2	33 kV System	Bays	6		
1.3	11 kV System ( Indoor Switchgear)	Bays	2		
2.0	Integration of all 132/33/11kV Bays under present scope with the SCADA of SIEMENS (Power 7) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1		
<b>b)</b>	<b>RTU INTEGRATION AT GHORAH S/S</b>				
<b>(i)</b>	Necessary extension, reorientation, reconfiguration and adaptation of existing RTU including supply of necessary cards, cables, connectors and other hardware and software required for data transmission and remote operation of new 132 kV bays	LS	1		

(ii)	Integration of all 132kV Bays under present scope with the SCADA of SIEMENS (Power 7) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	LS	1		
<b>3.0</b>	<b>COMMUNICATION AND SCADA</b>				
3.1	Digital Protection Coupler	nos	4		
<b>3.2 (A)</b>	<b>Telecommunication equipments for Khungri S/S</b>				
<b>3.2.1.A</b>	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)				
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equipped to complete function as per requirement in specification excluding (ii) & (iii) below	LS	1		
(ii)	Optical Interface Cards/ SFP				
(a)	L4.2 SFP	Nos.	2		
(iii)	Tributary cards				
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2		
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
3.2.2. A	<b>Equipment Cabinets</b>	No.	1		
3.2.3.A	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2		
<b>3.2 (B)</b>	<b>Telecommunication equipments for Ghorahi S/S</b>				
3.2.1.B	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)				

(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equipped to complete function as per requirement in specification excluding (ii) & (iii) below	LS	1		
(ii)	Optical Interface Cards/SFP				
(a)	L4.1 SFP	Nos.	4		
(b)	L4.2 SFP	Nos.	2		
(iii)	Tributary cards				
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2		
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
3.2.2. B	Equipment Cabinets	No.	1		
3.2.3.B	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2		
	<b>SUB TOTAL OF COMMUNICATION &amp; SAS EQUIPMENTS</b>				
<b>C)</b>	<b>CIVIL WORKS</b>				
<b>1.0</b>	<b>Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, gusset plates and all accessories: (For 132 and 33 kV side)</b>				
1.1	132 kV take off gantry structures	LS	1		
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure	LS	1		
1.3	145 kV SF6 circuit breaker	sets	6		

1.4	145 kV disconnecting switch with earth switch	sets	4		
1.5	145 kV disconnecting switch without earth switch	sets	12		
1.6	132 kV voltage transformer	nos	18		
1.7	132 kV current transformer	nos	18		
1.8	120 kV surge arrestor	nos	15		
1.9	132 kV Bus post insulator	no.	60		
1.10	132 kV Double circuit dead end galvanized lattice tower as per employer provided tested drawings	no.	1		
1.11	33 kV take off gantry structures	LS	1		
1.12	33 kV internal gantry structures	LS	1		
1.13	36 kV vacuum circuit breaker	sets	7		
1.14	33 kV disconnecting switch with earth switch	sets	5		
1.15	33 kV disconnecting switch without earth switch	sets	7		
1.16	33 kV voltage transformer	nos	18		
1.17	33 kV current transformer	nos	21		
1.18	30 kV surge arrestor	nos	21		
1.19	33 kV Bus post insulator	no.	30		
1.20	Rail Structure for 132/33 Power Transformer including access from inter road (For transformer shifting)	LS	1		
1.21	Lightning/ Earth Mast	Set	2		
	<b>SUB TOTAL OF STEEL STRUCTURES</b>				
<b>D)</b>	<b>SPARE PARTS</b>				
<b>1.0</b>	<b>Transformer</b>				

<b>a)</b>	<b>132/33 kV Transformer:</b>				
1.0	OLTC motor with contactor	sets	1		
2.0	Cooler Fan with motor	nos	1		
3.0	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1		
4.0	Buchholz relay complete with contacts (Main tank)	sets	1		
5.0	Magnetic oil level gauge	nos	1		
6.0	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1		
7.0	Complete set of pressure relief device	set	1		
8.0	145 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
9.0	36 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
10.0	Spare insulating oil to be handed over to NEA after commissioning for O&M requirement including tank	KL	15		
<b>b)</b>	<b>33/ 11 kV Transformer</b>				
1.0	OLTC motor with contactor	sets	1		
2.0	Local & Remote WTI and OTI with sensing device & contact (each type)	sets	1		
3.0	Buchholz relay complete with contacts (Main tank)	sets	1		
4.0	Magnetic oil level gauge	nos	1		
5.0	Starters, contactors, switches & relays for electrical control panels (one set of each type)	sets	1		
6.0	Complete set of pressure relief device	set	1		
7.0	36 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
8.0	11 kV Bushing with metal parts and gaskets and lifting tools	nos	1		
<b>2.0</b>	<b>145 KV SF6 CIRCUIT BREAKER:</b>				

2.1	Complete set of interrupting chamber	set	1		
2.2	Rubber gaskets, `O' rings and seals for SF6 gas (1 No. of each type)	sets	1		
2.3	Trip coil assembly with resistor as applicable	sets	3		
2.4	Closing coil assembly with resistor as applicable	sets	3		
2.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1		
2.6	Gas filling equipment with accessories	sets	1		
2.7	Motor for mechanism	nos	1		
<b>3.0</b>	<b>33 KV VACCUME CIRCUIT BREAKER:</b>				
3.1	Complete set of interrupting chamber	set	1		
3.2	Rubber gaskets, `O' rings and seals (1 No. of each type)	sets	1		
3.3	Trip coil assembly with resistor as applicable	sets	3		
3.4	Closing coil assembly with resistor as applicable	sets	3		
3.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1		
3.6	Motor for mechanism	nos	1		
<b>4.0</b>	<b>145 KV ISOLATORS :</b>				
4.1	Porcelain insulators	nos	3		
4.2	Main contact assemblies (one assembly)	sets	3		
4.3	Auxiliary contact assemblies (one assembly)	sets	3		
4.4	Interlocking coil	sets	2		
4.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1		



4.6	Limit switch and Aux. Switches for complete 3 phase equipment				
4.6.1	For isolator	sets	1		
4.6.2	For earth switch	sets	1		
<b>5.0</b>	<b>33 KV ISOLATORS :</b>				
5.1	Porcelain insulators	nos	3		
5.2	Main contact assemblies (one assembly)	sets	3		
5.3	Auxiliary contact assemblies (one assembly)	sets	3		
5.4	Interlocking coil	sets	2		
5.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1		
5.6	Limit switch and Aux. Switches for complete 3 phase equipment				
5.6.1	For isolator	sets	1		
5.6.2	For earth switch	sets	1		
<b>6.0</b>	<b>145 KV Instrument Transformer:</b>				
6.1	132 kV Current transformer (excluding support structure and common JB) for transformer	no	1		
6.2	132 kV Current transformer (excluding support structure and common JB) for line and bus coupler	no	2		
6.3	132kV, VT (excluding support structure/ common JB)	no	2		
6.4	33 kV Current transformer (excluding support structure and common JB)	no	3		
6.5	33 kV PT (excluding support structure/ common JB)	no	2		



<b>7.0</b>	<b>AIS Surge Arrestors: (Outdoor)</b>				
7.1	120 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	2		
7.2	30 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	no	6		
7.3	9 kV Surge Arrestor with insulating base, terminal connector , Surge counter & accessories (excluding support structure)	nos	3		
<b>8.0</b>	<b>110 V Battery Chargers</b>				
8.1	Set of Control Cards	sets	1		
8.2	Set of relays	sets	1		
8.3	Rectifier transformer	nos	1		
8.4	Thyristor/ Diode	sets	1		
8.5	Fuses of Thyristor with indicators	sets	6		
9.0	<b>48V Battery Chargers</b>				
9.1	Set of Control Cards	sets	1		
9.2	Set of relays	sets	1		
9.3	Rectifier transformer	no	1		
9.4	Thyristor/ Diode	sets	1		
9.5	Fuses of Thyristor with indicators	sets	6		
10.0	<b>Relay &amp; Protection (132 kV):</b>				
10.1	<b>Line Protection Panel</b>				
10.1.1	Numerical distance relay (1 no. of each type)	set	1		



10.2	<b>Transformer Protection Panel</b>				
10.2.1	Transformer differential protection	no	1		
10.2.2	Restricted earth fault protection relay with non-linear resistor	no	1		
10.2.3	Directional over current & E/F Protection Relay	no	1		
10.3	<b>COMMON SPARES</b>				
10.3.1	Breaker failure relay	no	1		
10.3.2	Trip circuit supervision relay	nos	2		
10.3.3	Self-reset trip relay (relay of each type)	set	1		
10.3.4	Hand reset trip relay (relay of each type)	set	1		
10.3.5	Timer relay (relay of each type)	set	1		
10.3.6	DC supervision relay (relay of each type)	set	1		
10.3.7	Flag relays (relay of each type)	set	1		
10.3.8	Auxiliary relays (relay of each type)	set	1		
10.3.9	Indicating lamps of each type	nos	6		
10.3.10	Fuse of each type	nos	6		
10.3.11	Color caps of each color for indicating lamp	nos	3		
10.3.12	Ammeter	nos	2		
10.3.13	Voltmeter	nos	2		
<b>11.0</b>	<b>Relay &amp; Protection (33 kV):</b>				
11.1	<b>Line Protection Panel</b>				
11.1.1	Directional over current & E/F Protection Relay	set	1		
11.2	<b>Transformer Protection Panel</b>				

11.2.1	Transformer differential protection	no	1		
11.2.2	Restricted earth fault protection relay with non-linear resistor	no	1		
11.2.3	Directional over current & E/F Protection Relay	no	1		
11.3	<b>COMMON SPARES</b>				
11.3.1	Breaker failure relay	no	1		
11.3.2	Trip circuit supervision relay	nos	2		
11.3.3	Self-reset trip relay (relay of each type)	set	1		
11.3.4	Hand reset trip relay (relay of each type)	set	1		
11.3.5	Timer relay (relay of each type)	set	1		
11.3.6	DC supervision relay (relay of each type)	set	1		
11.3.7	Flag relays (relay of each type)	set	1		
11.3.8	Auxiliary relays (relay of each type)	set	1		
11.3.9	Indicating lamps of each type	nos	6		
11.3.10	Fuse of each type	nos	6		
11.3.11	Color caps of each color for indicating lamp	nos	3		
11.3.12	Ammeter	nos	2		
11.3.13	Voltmeter	nos	2		
<b>12.0</b>	<b>MV Indoor Switchgear (33 kV Switchgear):</b>				
12.1	33 kV Vacuum Interrupter	nos	3		
12.2	Tripping Coils	nos	3		
12.3	Closing Coils	nos	3		



12.4	Spring Charging Motor	set	1		
<b>12.5</b>	<b>Protection Relays:</b>				
12.5.1	3 phase Overcurrent Relay, for 33 kV side one of each type	nos	1		
12.5.2	Ground Fault Relay, for 33 kV side, one of each type	nos	1		
12.6	Ammeter, Nos one of each rating	nos	1		
12.70	Voltmeter	nos	1		
12.80	Indicating lamps and fuses (100% of used type), Lot	LS	1		
12.90	33 kV HT cable termination kit alongwith accessories for indoor	sets	3		
12.10	33 kV HT cable termination kit alongwith accessories for outdoor	sets	3		
<b>13.00</b>	<b>Indoor Switchgear (11 kV Switchgear):</b>				
13.10	11 kV Vacuum Interrupter	nos	3		
13.20	Tripping Coils	nos	3		
13.30	Closing Coils	nos	3		
13.40	Spring Charging Motor	set	1		
13.50	Protection Relays:				
13.5.1	3 phase Overcurrent Relay, for 11 kV side one of each type	nos	1		
13.5.2	Ground Fault Relay, for 11 kV side, one of each type	nos	1		
13.60	Ammeter, Nos one of each rating	nos	1		
13.70	Voltmeter	nos	1		
13.80	kVA Meter	nos	1		
13.90	Indicating lamps and fuses (100% of used type), Lot	LS	1		

13.10	11 kV HT cable termination kit along with accessories for indoor	sets	3		
13.11	11 kV HT cable termination kit along with accessories for outdoor	sets	3		
<b>14.0</b>	<b>Bus post Insulators:</b>				
14.10	132 kV	nos	6		
14.20	33 kV	nos	6		
<b>15.00</b>	<b>Communication and SCADA:</b>				
15.1	SDH (Cross Connect/control cards, optical base cards, power supply cards, management card)	each	1		
15.2	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
15.3	SFP L4.1	Nos.	2		
15.4	SFP L4.2	Nos.	2		
15.5	Digital Protection Coupler	Nos.	1		
<b>16.0</b>	<b>Miscellaneous:</b>				
16.1	Tonge tester as per specification	nos	1		
16.2	5 kV Insulation tester (Megger)	nos	1		
	<b>SUB TOTAL OF SPARE PARTS</b>				
				<b>TOTAL OF SCHEDULE 2</b>	

**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Khungri Substation**

**Schedule No. 3 : Design Services**

Sl. No.	Description	Item	Quantity	Unit	Total amount		
					Currency (US \$)	Total NRs	
		1	2	3	5	6 = 3x4x5	
A	NOT APPLICABLE						
	<b>Total</b>						

**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Khungri Substation**

<b>Schedule No.4 (a) : Construction, Installation, Testing and Commissioning Services</b>					
S. No.	Item Description	Unit	Quantity	Total Price Excluding Taxes and duties	
				Unit Rate NRs	Amount in NRs
		(1)	(2)	(3)	(4) = (2) x (3)
A)	<b>ELECTRICAL INSTALLATION WORKS</b>				
a)	<b>POWER TRANSFORMER</b>				
1.0	30 MVA, 132/33 kV, three phase, power transformer complete with on load tap changer (OLTC), RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides ,Star/star complete with all accessories	no	1		
2.0	6/8 MVA, ONAN/ONAF, 33/11kV,three phase, power transformer complete with on load tap changer (OLTC), RTCC facility with Tank Mounted LA at LV side and Bushing CT on both sides complete with all accessories	no	1		
b)	<b>LT TRANSFORMER</b>				
1.0	250 kVA, 33/0.4 kV station service transformer as per technical specification and drawings	lot	1		
c)	<b>CIRCUIT BREAKER &amp; SWITCHGEAR</b>				
1.0	145 kV, 2000 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for bus coupler)	sets	1		
2.0	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV side of power transformer & 132 kV lines)	sets	5		

3.0	36 kV, 2000 A, 25 kA, 1 sec, 3 phase, vacuum circuit breaker for 33 kV side of power transformer complete with all accessories	sets	1		
4.0	36 kV, 1250 A, 25 kA, 1 sec, 3 phase, vacuum circuit breaker complete with all accessories	sets	6		
<b>d)</b>	<b>DISCONNECTING SWITCHES:</b>				
1.0	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch	sets	4		
2.0	145 kV, 2000 A, 3 phase center break disconnecting switch without grounding switch	sets	2		
3.0	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch	sets	10		
4.0	36 kV, 1250 A, 3 phase disconnecting switch with grounding switch	sets	5		
5.0	36 kV, 2000 A, 3 phase disconnecting switch without grounding switch	sets	1		
6.0	36 kV, 1250 A, 3 phase disconnecting switch without grounding switch	sets	6		
<b>e)</b>	<b>INSTRUMENT TRANSFORMERS:</b>				
1.0	145 kV, 50 VA, 132/ $\sqrt{3}$ /110/ $\sqrt{3}$ kV, Class 0.2/3P Voltage Transformer complete with all accessories as per specification	nos	18		
2.0	145 kV, 30 VA 5 core current transformer for Line & Bus coupler complete with all accessories as per specification	nos	15		
3.0	145 kV, 30 VA 5 core current transformer for power transformer complete with all accessories as per specification	nos	3		
4.0	36 kV, 50 VA, 33/ $\sqrt{3}$ /110/ $\sqrt{3}$ V potential transformer complete with all accessories as per specification	nos	18		



5.0	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification	nos	3		
6.0	36 kV, 30 VA 3 core current transformer complete with all accessories as per specification.	nos	18		
<b>f)</b>	<b>LIGHTNING ARRESTORS:</b>				
1.0	120 kV, 10 kA Surge arrester (1 phase) including discharge counter	nos	15		
2.0	30 kV, 10 kA Surge arrester (1 phase) including discharge counter	nos	21		
3.0	9 kV Surge arrester (1 phase) including discharge counter	nos	6		
<b>g)</b>	<b>CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)</b>				
1.0	132/33 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1		
2.0	33/11 kV transformer control and relay panel complete with all accessories as per technical specifications	sets	1		
3.0	132 kV Bus bar and Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1		
4.0	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	4		
5.0	33 kV line control and relay panel complete with all accessories as per technical specifications	sets	4		
<b>h)</b>	<b>CABLES ALONG WITH CLAMPS, GLANDS, LUGS ETC.</b>				
1.0	132 kV 1000 sq. mm single core XLPE power cable with all accessories and termination equipments in both ends to complete the scope of work.	Meter	500		



2.0	11 kV HT Copper Cable (1CX400 SQmm, two cable per phase) for 11 kV side of 33/11 kV transformer along with accessories and termination equipments in both ends.	Meter	550		
3.0	11 kV HT armored Cable 3C, 300 Sq.mm Aluminum along with accessories and termination equipments for both ends with double pole structure for two outgoing 11 kV feeder line	Meter	800		
4.0	11 kV HT 3C, 50 Sq.mm Aluminum Cable along with accessories and termination equipments both ends for termination of 11 kV LT Transformer	LS	1		
5.0	0.4 kV HT Aluminum Cable (3.5 C, 300 Sq. mm) for 0.4 kV side of 33/0.4 kV LT transformer along with accessories and termination equipments for AC Distribution Panel	LS	1		
6.0	33 kV HT armored Copper Cable (1CX240 SQmm) for 5 nos of 33 kV feeder line along with accessories including flexible pipe and termination equipments and structure at both end	Meter	1200		
7.0	<b>Power Cables - (1.1 kV grade)</b>				
7.1	Required size of Power/ Control copper cable for switchyard, control room and communication purpose and others if any to complete the work as per specification.	LS	1		
7.2	Required size of Power/ Control copper cable for staff quarter building parking shade, playing court as main supply and others if any to complete the work as per specification.	LS	1		
7.3	Cable glands, lugs for Power & Control cables	LS	1		
<b>i)</b>	<b>Grounding</b>				
1.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories	LS	1		
2.0	Lightning protection system with lightning mast, copper conductor, electrodes complete with all accessories for control building	Ls	1		

3.0	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1		
<b>j)</b>	<b>BATTERIES AND BATTERY CHARGER</b>				
1.0	Float cum boost battery charger for 110 V battery (45A/45A) complete with all accessories	nos	2		
2.0	Float cum boost battery charger for 48 V battery (45A/45A) complete with all accessories	nos	2		
3.0	110 V, 600 AH batteries complete with all accessories	sets	1		
4.0	48 V, 300 AH batteries complete with all accessories	sets	1		
<b>k)</b>	<b>Bus post Insulator:</b>				
1.0	132 kV Bus post insulators	nos	60		
2.0	33 kV Bus post insulators	nos	30		
<b>l)</b>	<b>ERECTION &amp; MISCELLANEOUS MATERIALS</b>				
1.0	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower	lot	1		
2.0	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1		
3.0	33 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line pole	lot	1		
4.0	33 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line pole	lot	1		
5.0	Main Tubular bus including all other accessories required to complete 132 kV double bus-bar configuration	LS	1		
6.0	Main tubular bus (for 33 bus bar), branch bus bar (for 132 kV) including branch bus bar for 33 kV and other accessories required to complete the job	LS	1		

7.0	33 kV distribution line Material for double circuit (Galvanized Steel Tubular Pole , Conductor ACSR 'DOG, Insulators, galvanized cross arms, angle for bracing, spandle, bracing angle, flat strip, I & U bolt, nut & bolts etc) including stay set and foundation concreting with max span 40 mtr to complete the specified scope of the work as per NEA standards	KM	2.0		
8.0	<b>Air conditioning System:</b>				
8.1	Ceiling cassette type split AC unit of 3 TR capacities for 132 kV control room	Nos	4		
8.2	High wall type split AC unit of 2 TR capacities for 11 kV switchgear room	Nos	3		
8.3	High wall type split AC unit of 1.5 TR capacities for communication, battery, office room and staff quarter building	Nos	8		
9.0	<b>Fire Protection System (Portable /Trolley/Wheel mounted extinguishers)</b>				
9.1	30 liter foam type	Nos	4		
9.2	4.5 kg CO2 type	Nos	9		
9.3	22.5 kg Dry Chemical Powder (DCP) type	Nos	4		
9.4	Smoke detection system	LS	1		
9.5	Fire detection and Alarm System for control room	Ls	1		
10.0	Identification plate, danger notice etc	LS	1		
<b>m)</b>	<b>LT Switchgear (As per Technical specification)</b>				
1.0	400 V AC Main switchboard panel	sets	1		
2.0	110 V DCDB	sets	1		
3.0	48 V DCDB	sets	1		

n)	<b>12 KV VCB Switchgear Panel with all accessories as per specified</b>				
1.0	12 kV Transformer incomer module (2000A) (IP-2) with all accessories as per specification	sets	1		
2.0	12 kV Outgoing Line Module (1250A) (IP-1) with all accessories as per specification	sets	4		
3.0	12 kV PT module (IP-3) with all accessories as per specification	sets	1		
o)	<b>Illumination System</b>				
1.0	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary ) as per technical specification	LS	1		
2.0	Emergency DC lighting system for switchyard	Nos	12		
	<b>SUB TOTAL OF ELECTRICAL WORKS</b>				
B)	<i>SUBSTATION AUTOMATION/ COMMUNICATION/ SCADA (Based on IEC 61850)</i>				
a)	<b>SUBSTATION AUTOMATION SYSTEM:</b>				
1.0	<b>Complete Substation automation system including hardware and software for the substation &amp; remote control stations alongwith associated equipments for the followings as per Technical Specification.</b>				
1.1	132 kV System	bays	6		
1.2	33 kV System	bays	6		
1.3	11 kV System ( Indoor Switchgear)	bays	2		
2.0	Integration of all 132/33/11kV Bays under present scope with the SCADA of SIEMENS (Power 7) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	lot	1		
b)	<b>RTU INTEGRATION AT GHORAH S/S</b>				

(i)	Necessary extension, reorientation, reconfiguration and adaptation of existing RTU including supply of necessary cards, cables, connectors and other hardware and software required for data transmission and remote operation of new 132 kV bays	Lot	1		
(ii)	Integration of all 132kV Bays under present scope with the SCADA of SIEMENS (Power 7) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. as per TS Section Project.	Lot	1		
<b>3.0</b>	<b>COMMUNICATION AND SCADA</b>				
3.1	Digital Protection Coupler	nos	4		
<b>3.2 (A)</b>	<b>Telecommunication equipments for Khungri S/S</b>				
3.2.1.A	SDH Equipment (STM-4 MADM upto 4 MSP protected directions)				
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equipped to complete function as per requirement in specification excluding (ii) & (iii) below	Lot	1		
(ii)	<b>Optical Interface Cards/ SFP</b>				
(a)	L4.2 SFP	Nos.	2		
(iii)	<b>Tributary cards</b>				
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2		
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
3.2.2. A	Equipment Cabinets	No.	1		
3.2.3.A	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2		
<b>3.2 (B)</b>	<b>Telecommunication equipments for Ghorahi S/S</b>				

3.2.1.B	<b>SDH Equipment (STM-4 MADM upto 4 MSP protected directions)</b>				
(i)	Base Equipment (Common cards, Cross Connect/control cards, optical base cards, power supply cards, power cabling, other hardware and accessories including sub racks, patch cord, DDF etc fully equipped to complete function as per requirement in specification excluding (ii) & (iii) below	Lot	1		
(ii)	<b>Optical Interface Cards/SFP</b>				
(a)	L4.1 SFP	Nos.	4		
(b)	L4.2 SFP	Nos.	2		
(iii)	<b>Tributary cards</b>				
(a)	E1 Interface card (Min.8 interfaces per card)	Set	2		
(b)	Ethernet Interface 10/100 Mbps Base T with Layer-2 switching (Min 4 Interfaces per card)	Nos.	2		
3.2.2. B	Equipment Cabinets	No.	1		
3.2.3.B	VOIP telephone instrument with one common POE switch (min. 8 port)	Nos.	2		
<b>SUB TOTAL OF COMMUNICATION/SCADA/SAS</b>					
<b>C)</b>	<b>CIVIL WORKS</b>				
1.0	<b>Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, gusset plates and all accessories: (For 132 and 33 kV side)</b>				
1.1	132 kV take off gantry structures	LS	1		
1.2	132 kV internal gantry structures including 132/33 kV and 33/11 kV transformer gantry structure	LS	1		
1.3	132 kV SF6 gas circuit breaker	sets	6		
1.4	132 kV disconnecting switch with earth switch	sets	4		

1.5	132 kV disconnecting switch without earth switch	sets	12		
1.6	132 kV voltage transformer	nos	18		
1.7	132 kV current transformer	nos	18		
1.8	120 kV surge arrestor	nos	15		
1.9	132 kV Bus post insulator	nos	60		
1.10	132 kV double circuit dead end tower	nos	1		
1.11	33 kV take off gantry structures	LS	1		
1.12	33 kV internal gantry structures	LS	1		
1.13	33 kV circuit breaker	sets	7		
1.14	33 kV disconnecting switch with earth switch	sets	5		
1.15	33 kV disconnecting switch without earth switch	sets	7		
1.16	33 kV potential transformer	nos	18		
1.17	33 kV current transformer	nos	21		
1.18	30 kV surge arrestor	nos	21		
1.19	33 kV Bus post insulator	nos	30		
1.20	Rail Structure for 132/33 and 33/11 kV Power Transformer including access from inter road (For transformer shifting)	LS	1		
1.21	Lightning/Earth Mast	Set	2		
1.22	Supply and fitting of switchyard fence including 2 nos gate/s including fence, pole and gate supply and civil works as per specification & drawing	RM	400		
	<b>SUB TOTAL OF STEEL STRUCTURAL WORKS</b>				
<b>D)</b>	<b>CIVIL WORKS( MATERIAL PLUS LABOUR)</b>				



<b>1.0</b>	<b>Concrete Foundation for equipments and Steel Structures complete with excavation, backfilling, form works, lean concrete works and reinforcement bars:</b>				
1.1	132 kV take off gantry structures	LS	1		
1.2	132 kV internal gantry structures including 132/33 kV transformer gantry structure	LS	1		
1.3	132 kV SF6 gas circuit breaker	sets	6		
1.4	132 kV disconnecting switch with earth switch	sets	4		
1.5	132 kV disconnecting switch without earth switch	sets	12		
1.6	132 kV capacitor voltage transformer	nos	18		
1.7	132 kV current transformer	nos	18		
1.8	120 kV surge arrestor	nos	15		
1.90	132 kV Bus post insulator	nos	60		
1.10	Lightning/Earth Mast	nos	2		
1.11	132 kV double circuit dead end tower complete as per attached drawing	nos	1		
1.12	33 kV take off gantry structures	LS	1		
1.13	33 kV internal gantry structures	LS	1		
1.14	33 kV vacuum circuit breaker	sets	7		
1.15	33 kV disconnecting switch with earth switch	sets	5		
1.16	33 kV disconnecting switch without earth switch	sets	7		
1.17	33 kV potential transformer	nos	18		
1.18	33 kV current transformer	nos	21		
1.19	30 kV and 9 kV surge arrestor	nos	27		
1.20	33 kV Bus post insulator	no.	30		
1.21	Rail Structure for 132/33 and 132/11 kV Power Transformer including access from inter road (For transformer shifting)	LS	1		

1.22	132/33 kV, 3 phase, 30 MVA power transformer foundation as per spec	nos	1		
1.23	33/0.4 kV, 3 phase, 250 KVA station transformer	nos	1		
1.24	Cable trench and conduit for 132 kV incomer feeder upto 33 kV switchgear room and outgoing feeder as per site condition and design	LS	1		
1.25	Cable trench and conduit for 33 kV incomer feeder upto 33 kV switchgear room and outgoing feeder as per site condition and design	LS	1		
1.26	Complete Drains system including RCC slab cover	LS	1		
1.27	Cable trench and conduit for 33 kV outgoing feeder in switchyard area , culvert area , boundary wall crossing as per site condition and design	LS	1		
1.28	6/8 MVA, ONAN/ONAF, 33/11kV, Distribution Transformer foundation works.	nos	1		
1.29	Rail Structure for 6/8 MVA ONAN/ONAF, 33/11 kV distribution Transformer including access from inter road (For transformer shifting)	LS	1		
<b>2.0</b>	<b>Miscellaneous works:</b>				
2.1	Exploration works for soil strength of foundations including laboratory tests, trial pitting, plate load test as specified in "Geotechnical Investigation"	locations	7		
2.2	Soil resistivity test	lot	1		
2.3	Site grading with earth filling by borrow pit earth including compaction and leveling etc all to complete the specified works as per technical specification	Cu.M	47820		
2.4	Crushed rock surfacing including laying of sand and plastic as per technical specifications	Cu.M	3000		
2.5	Asphalt Road as per technical specification	Sq.M	3000		
2.6	Water supply system including testing of water quality	LS	1		

2.7.1	Numbering, blazing, falling down and clearing of trees approx. (around 80 nos of trees) inside substation and substation access road area, their handling and storage nearby substation are as directed by district forest office	LS	1		
2.7.2	Removing of roots of trees as in item 2.7.1.	LS	1		
<b>SUB TOTAL OF CONCRETE FOUNDATION WORKS (D)</b>					
3.0	<b>Control building (material plus labour) (plinth Area 352 Sq.m.) as per specification along with all finishing works including electrification, air conditioning, false ceiling, cable trench, sanitary and plumbing works, water supply, furniture and miscellaneous work etc as specified to complete the scope of work.</b>	LS	1		
4.0	<b>Construction of two, two storee staff quarter (each of 480 Sq.m floor area for both floor and total of 960 sq. meter) including indoor fittings and furniture along with all finishing works including electrification, air conditioning, sanitary and plumbing works, water supply, furniture and miscellaneous work etc as per drawing and specification to complete the scope of work.</b>	LS	1		
5.0	<b>Construction of one storee guard house (40 Sq.m floor area) including indoor fittings and furniture along with all finishing works including electrification, sanitary and plumbing works, water supply, furniture and miscellaneous work etc as per drawing and specification to complete the scope of work.</b>	LS	1		
6.0	<b>Miscellaneous Civil works:</b>				
6.1	M20 Conc. Nominal Mix 1:1.5:3 for protection work.	Cub m	100		
6.2	Reinforcement Bars	Kg	31400		
6.3	Gabion Box Protection	Cub.m	1500		



6.4	Stone Masonary	Cub.m	500		
<b>SUB TOTAL</b>					
<b>TOTAL OF SCHEDULE-4 (a)</b>					

**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
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**Price Schedule for Khungri Substation**

**Schedule No. 4 (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 (US \$)
		1	2	3	4	5
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,		3	5	
		ii)Transformer		3	5	
<b>Total for Training Charges</b>						

**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Khungri Substation**

**Schedule No. 4 (c) : Training Charges for training to be imparted in Nepal**

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 (US \$)	Total Training Charges in NRs
		1	2	3	4	5	6 = 3x4x5
A	NOT APPLICABLE						
						<b>Total for Training Charges</b>	

**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Khungri Substation**

**Schedule No. 4 (d): Maintenance Charge**

Sl. No.	Description	Unit	Quantity	Total Charges	
				Currency( NRs)	Total Charges
		1	2	3	4 = 2x 3
1	Maintenance Charges for Communication Equipments including SDH & MUX. for One (1) year during Warranty period for both Khungri and Ghorahi substations.	Year	1		
2	Maintenance Charges for Communication Equipments including SDH & MUX. for Six (6) years after Warranty period for both Khungri and Ghorahi substations.	Year	6		
<b>Total Maintenance Charges for Communication Equipment Package</b>					<b>-</b>

# Ghorahi Substation





**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Ghorahi Substation**

**Schedule No.1:- Plant and Equipment (including Mandatory Spares Parts) Supplied from Abroad including Insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Unit	Quantity	CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal)	
				Unit Rate US\$	Amount US\$
		(1)	(2)	(3)	(4) = (2) x (3)
<b>A)</b>	<b>ELECTRICAL WORKS</b>				
<b>a)</b>	<b>CIRCUIT BREAKER &amp; SWITCHGEAR</b>				
1.0	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV lines)	sets	2.00		
<b>b)</b>	<b>DISCONNECTING SWITCHES:</b>				
1.0	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch	sets	2.00		
2.0	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch	sets	4.00		
<b>c)</b>	<b>INSTRUMENT TRANSFORMERS:</b>				

1.0	145 kV, 50 VA, 132/√3/110/√3 kV, Class 0.2/3P Voltage Transformer complete with all accessories as per specification.	nos	12.00		
2.0	145 kV, 30 VA 5 core current transformer for Lines complete with all accessories as per specification	nos	6.00		
<b>d)</b>	<b>LIGHTNING ARRESTORS:</b>				
1.0	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	6.00		
<b>e)</b>	<b>CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)</b>				
1.0	132 kV Bus bar and Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1.00		
2.0	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	2.00		
<b>f)</b>	<b>CABLES ALONG WITH CLAMPS, GLANDS, LUGS ETC.</b>				
<b>1.0</b>	<b>1.1 kV GRADE LOW VOLTAGE CABLES</b>				
1.1	Power Cables (PVC)	LS	1.00		
1.2	Control Cables (PVC)	LS	1.00		
1.3	Cable glands, lugs for Power & Control cables	LS	1.00		
<b>g)</b>	<b>Grounding</b>				
1.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories	LS	1.00		

2.0	Lightning protection system with lightning mast, copper conductor, electrodes complete with all accessories for control building	LS	1.00		
3.0	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1.00		
<b>h)</b>	<b>Bus post Insulator:</b>				
1.0	132 kV Bus post insulators	nos	30.00		
<b>i)</b>	<b>ERECTION &amp; MISCELLANEOUS MATERIALS</b>				
1.0	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower	lot	1.00		
2.0	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1.00		
3.0	ACSR "CARDINAL" conductors and accessories to complete the specified scope of works	LS	1.00		
4.0	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1.00		
5.0	Identification plate, danger notice etc	LS	1.00		
<b>j)</b>	<b>Illumination System</b>				
1.0	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary ) as per technical specification	LS	1.00		
2.0	Emergency DC lighting system complete for switchyard	Nos	6.00		

	<b>SUB TOTAL OF ELECTRIC EQUIPMENTS</b>				
<b>B)</b>	<b><i>SUBSTATION AUTOMATION/ COMMUNICATION / SCADA (Based on IEC 61850)</i></b>				
<b>C)</b>	<b>CIVIL WORKS</b>				
1	Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, guest paltes and all accessories: (For 132 and 33 kV side)				
1.1	132 kV take off gantry structures	LS	1.00		
1.2	132 kV internal gantry structures	LS	1.00		
1.3	145 kV SF6 gas circuit breaker	sets	2.00		
1.4	145 kV disconnecting switch with earth switch	sets	2.00		
1.5	145 kV disconnecting switch without earth switch	sets	4.00		
1.6	132 kV voltage transformer	nos	12.00		
1.7	132 kV current transformer	nos	6.00		
1.8	120 kV surge arrestor	nos	6.00		
1.9	132 kV Bus post insulator	no.	30.00		
1.10	132 kV Double circuit dead end galvanized lattice tower as per employer provided tested drawings	no.	1.00		
1.11	Lightning/Earth Mast	Set	2.00		
	<b>SUB TOTAL OF STEEL STRUCTURES</b>				
<b>D)</b>	<b>SPARE PARTS</b>				
<b>1.0</b>	<b>145 KV SF6 CIRCUIT BREAKER:</b>				

1.1	Complete set of interrupting chamber	set	1.00		
1.2	Rubber gaskets, 'O' rings and seals for SF6 gas (1 No. of each type)	sets	1.00		
1.3	Trip coil assembly with resistor as applicable	sets	2.00		
1.4	Closing coil assembly with resistor as applicable	sets	2.00		
1.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1.00		
1.6	Gas filling equipment with accessories	sets	1.00		
1.7	Motor for mechanism	nos	1.00		
<b>2.0</b>	<b>145 KV ISOLATORS :</b>				
2.1	Porcelain insulators	nos	3.00		
2.2	Main contact assemblies (one assembly)	sets	2.00		
2.3	Auxiliary contact assemblies (one assembly)	sets	2.00		
2.4	Interlocking coil	sets	2.00		
2.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1.00		
2.6	Limit switch and Aux. Switches for complete 3 phase equipment				
2.6.1	For isolator	sets	1.00		
2.6.2	For earth switch	sets	1.00		
<b>3.0</b>	<b>145 KV Instrument Transformer:</b>				
3.1	132 kV Current transformer (excluding support structure and common JB) for line bays.	no	3.00		
3.2	132kV, VT (excluding support structure/ common JB)	no	3.00		



<b>4.0</b>	<b>AIS Surge Arrestors: (Outdoor)</b>				
4.1	120 kV Surge Arrestor with insulating base, terminal connector, Surge counter & accessories (excluding support structure)	no	3.00		
<b>5.0</b>	<b>Relay &amp; Protection (132 kV):</b>				
5.1	Line Protection Panel				
5.1.1	Numerical distance relay (1 no. of each type)	set	1.00		
<b>5.2</b>	<b>COMMON SPARES</b>				
5.2.1	Breaker failure relay	no	1.00		
5.2.2	Trip circuit supervision relay	nos	1.00		
5.2.3	Self-reset trip relay (relay of each type)	set	1.00		
5.2.4	Hand reset trip relay (relay of each type)	set	1.00		
5.2.5	Timer relay (relay of each type)	set	1.00		
5.2.6	DC supervision relay (relay of each type)	set	1.00		
5.2.7	Flag relays (relay of each type)	set	1.00		
5.2.8	Auxiliary relays (relay of each type)	set	1.00		
5.2.9	Indicating lamps of each type	nos	6.00		
5.2.10	Fuse of each type	nos	6.00		
5.2.11	Color caps of each color for indicating lamp	nos	3.00		
5.2.12	Ammeter	nos	2.00		
5.2.13	Voltmeter	nos	2.00		

<b>6.0</b>	<b>Bus post Insulators:</b>				
6.1	132 kV	nos	6.00		
	<b>SUB TOTAL OF SPARE PARTS</b>				
				<b>TOTAL OF SCHEDULE 1</b>	



**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
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**Price Schedule for Ghorahi Substation**

**Schedule No.2:- Plant and Equipment (including Mandatory Spares Parts) Supplied Within Nepal including insurance, Clearing, Forwarding and transportation up to site.**

S. No.	Item Description	Unit	Quantity	CIP Project Site including insurance, clearing, forwarding and transportation to site (Excluding Taxes and Duties applicable in Nepal)	
				Unit Rate US\$	Amount US\$
		(1)	(2)	(3)	(4) = (2) x (3)
<b>A)</b>	<b>ELECTRICAL WORKS</b>				
<b>a)</b>	<b>CIRCUIT BREAKER &amp; SWITCHGEAR</b>				
1.0	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV lines)	sets	2.00		
<b>b)</b>	<b>DISCONNECTING SWITCHES:</b>				
1.0	145 kV, 1250 A, 3 phase center break disconnecting switch with grounding switch	sets	2.00		
2.0	145 kV, 1250 A, 3 phase center break disconnecting switch without grounding switch	sets	4.00		
<b>c)</b>	<b>INSTRUMENT TRANSFORMERS:</b>				



1.0	145 kV, 50 VA, 132/ $\sqrt{3}$ /110/ $\sqrt{3}$ kV, Class 0.2/3P Voltage Transformer complete with all accessories as per specification.	nos	12.00		
2.0	145 kV, 30 VA 5 core current transformer for Lines complete with all accessories as per specification	nos	6.00		
<b>d)</b>	<b>LIGHTNING ARRESTORS:</b>				
1.0	120 kV, 10 kA Surge arrester (1 phase) including discharge counter complete with all accessories as per specification	nos	6.00		
<b>e)</b>	<b>CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)</b>				
1.0	132 kV Bus bar and Bus coupler control and relay panel complete with all accessories as per technical specifications	sets	1.00		
2.0	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	2.00		
<b>f)</b>	<b>CABLES ALONG WITH CLAMPS, GLANDS, LUGS ETC.</b>				
<b>1.0</b>	<b>1.1 kV GRADE LOW VOLTAGE CABLES</b>				
1.1	Power Cables (PVC)	LS	1.00		
1.2	Control Cables (PVC)	LS	1.00		
1.3	Cable glands, lugs for Power & Control cables	LS	1.00		
<b>g)</b>	<b>Grounding</b>				
1.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories	LS	1.00		

2.0	Lightning protection system with lightning mast, copper conductor, electrodes complete with all accessories for control building	LS	1.00		
3.0	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1.00		
<b>h)</b>	<b>Bus post Insulator:</b>				
1.0	132 kV Bus post insulators	nos	30.00		
<b>i)</b>	<b>ERECTION &amp; MISCELLANEOUS MATERIALS</b>				
1.0	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower	lot	1.00		
2.0	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1.00		
3.0	ACSR "CARDINAL" conductors and accessories to complete the specified scope of works	LS	1.00		
4.0	Main Tubular bus, expansion joint including all other accessories required to complete 132 kV double bus-bar configuration	LS	1.00		
5.0	Identification plate, danger notice etc	LS	1.00		
<b>j)</b>	<b>Illumination System</b>				
1.0	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary ) as per technical specification	LS	1.00		
2.0	Emergency DC lighting system complete for switchyard	Nos	6.00		

	<b>SUB TOTAL OF ELECTRIC EQUIPMENTS</b>				
<b>B)</b>	<b><i>SUBSTATION AUTOMATION/ COMMUNICATION / SCADA (Based on IEC 61850)</i></b>				
<b>C)</b>	<b>CIVIL WORKS</b>				
1	Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, guest plates and all accessories: (For 132 and 33 kV side)				
1.1	132 kV take off gantry structures	LS	1.00		
1.2	132 kV internal gantry structures	LS	1.00		
1.3	145 kV SF6 gas circuit breaker	sets	2.00		
1.4	145 kV disconnecting switch with earth switch	sets	2.00		
1.5	145 kV disconnecting switch without earth switch	sets	4.00		
1.6	132 kV voltage transformer	nos	12.00		
1.7	132 kV current transformer	nos	6.00		
1.8	120 kV surge arrestor	nos	6.00		
1.9	132 kV Bus post insulator	no.	30.00		
1.10	132 kV Double circuit dead end galvanized lattice tower as per employer provided tested drawings	no.	1.00		
1.11	Lightning/Earth Mast	Set	2.00		
	<b>SUB TOTAL OF STEEL STRUCTURES</b>				
<b>D)</b>	<b>SPARE PARTS</b>				
<b>1.0</b>	<b>145 KV SF6 CIRCUIT BREAKER:</b>				



1.1	Complete set of interrupting chamber	set	1.00		
1.2	Rubber gaskets, `O' rings and seals for SF6 gas (1 No. of each type)	sets	1.00		
1.3	Trip coil assembly with resistor as applicable	sets	2.00		
1.4	Closing coil assembly with resistor as applicable	sets	2.00		
1.5	Relays, pressure switch, Power contactors, push buttons, timers & MCBs etc (1 No. of each type & rating)	sets	1.00		
1.6	Gas filling equipment with accessories	sets	1.00		
1.7	Motor for mechanism	nos	1.00		
<b>2.0</b>	<b>145 KV ISOLATORS :</b>				
2.1	Porcelain insulators	nos	3.00		
2.2	Main contact assemblies (one assembly)	sets	2.00		
2.3	Auxiliary contact assemblies (one assembly)	sets	2.00		
2.4	Interlocking coil	sets	2.00		
2.5	Push button switch - (1 No. of each type & rating) as applicable	sets	1.00		
2.6	Limit switch and Aux. Switches for complete 3 phase equipment				
2.6.1	For isolator	sets	1.00		
2.6.2	For earth switch	sets	1.00		
<b>3.0</b>	<b>145 KV Instrument Transformer:</b>				
3.1	132 kV Current transformer (excluding support structure and common JB) for line bays.	no	3.00		
3.2	132kV, VT (excluding support structure/ common JB)	no	3.00		

<b>4.0</b>	<b>AIS Surge Arrestors: (Outdoor)</b>				
4.1	120 kV Surge Arrestor with insulating base, terminal connector, Surge counter & accessories (excluding support structure)	no	3.00		
<b>5.0</b>	<b>Relay &amp; Protection (132 kV):</b>				
5.1	Line Protection Panel				
5.1.1	Numerical distance relay (1 no. of each type)	set	1.00		
<b>5.2</b>	<b>COMMON SPARES</b>				
5.2.1	Breaker failure relay	no	1.00		
5.2.2	Trip circuit supervision relay	nos	1.00		
5.2.3	Self-reset trip relay (relay of each type)	set	1.00		
5.2.4	Hand reset trip relay (relay of each type)	set	1.00		
5.2.5	Timer relay (relay of each type)	set	1.00		
5.2.6	DC supervision relay (relay of each type)	set	1.00		
5.2.7	Flag relays (relay of each type)	set	1.00		
5.2.8	Auxiliary relays (relay of each type)	set	1.00		
5.2.9	Indicating lamps of each type	nos	6.00		
5.2.10	Fuse of each type	nos	6.00		
5.2.11	Color caps of each color for indicating lamp	nos	3.00		
5.2.12	Ammeter	nos	2.00		
5.2.13	Voltmeter	nos	2.00		

<b>6.0</b>	<b>Bus post Insulators:</b>				
6.1	132 kV	nos	6.00		
	<b>SUB TOTAL OF SPARE PARTS</b>				
<b>TOTAL OF SCHEDULE 2</b>					



**NEPAL ELECTRICITY AUTHORITY**  
**Project Management Directorate**  
**Ghorahi-Madichaur 132 kV Transmission Line Project**  
**Price Schedule for Ghorahi Substation**

**Schedule No. 3 : Design Services**

SN	Description	item	Quantity	Unit	Total amount	
					Currency (US \$)	Total NRs
		1	2	3	5	6 = 3x4x5
A	NOT APPLICABLE					
					<b>Total</b>	

**NEPAL ELECTRICITY AUTHORITY**  
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**Price Schedule for Ghorahi Substation**

<b>Schedule No.4 (a) : Construction, Installation, Testing and Commissioning Services</b>					
S. No.	Item Description	Unit	Quantity	Total Price Excluding Taxes and duties	
				Unit Rate NRs	Amount in NRs
		(1)	(2)	(3)	(4) = (2) x (3)
A)	<b>ELECTRICAL WORKS</b>				
a)	<b>CIRCUIT BREAKER &amp; SWITCHGEAR</b>				
1.0	145 kV, 1250 A, 31.5 kA, 1 sec, 3 phase, SF6 circuit breaker complete with all accessories (for 132 kV lines)	sets	2		
b)	<b>DISCONNECTING SWITCHES:</b>				
1.0	145 kV, 1600 A, 3 phase center break disconnecting switch with grounding switch	sets	2		
2.0	145 kV, 1600 A, 3 phase center break disconnecting switch without grounding switch	sets	4		
c)	<b>INSTRUMENT TRANSFORMERS:</b>				
1.0	145 kV, 50 VA, 132/√3 /110/√3 kV, Class 0.2/3P Voltage Transformer complete with all accessories as per specification	nos	12		
2.0	145 kV, 30 VA current transformer	nos	6		



<b>d)</b>	<b>LIGHTNING ARRESTORS:</b>				
1.0	120 kV, 10 kA Surge arrester (1 phase) including discharge counter with all accessories as per technical specifications	nos	6		
<b>e)</b>	<b>CONTROL AND RELAY PANEL (WITH SUBSTATION AUTOMATION SYSTEM)</b>				
1.0	132 kV Bus bar control and relay panel complete with all accessories as per technical specifications	sets	1		
2.0	132 kV line control and relay panel complete with all accessories as per technical specifications	sets	2		
<b>f)</b>	<b>CABLES ALONG WITH CLAMPS, GLANDS, LUGS ETC.</b>				
<b>1.0</b>	<b>1.1 kV GRADE LOW VOLTAGE CABLES</b>				
1.1	Power Cables (PVC)	LS	1		
1.2	Control Cables (PVC)	LS	1		
1.3	Cable glands, lugs for Power & Control cables	LS	1		
<b>g)</b>	<b>Grounding</b>				
1.0	Galvanized E.H.S. steel wires of size 7/3.35 for lightning shield wire in take-off and internal structures complete with all accessories	LS	1		
2.0	Lightning protection system with lightning mast, copper conductor, electrodes complete with all accessories for control building	Ls	1		
3.0	Earthing of substation with conductors, electrode, grounding materials complete with all accessories	LS	1		
<b>h)</b>	<b>Bus post Insulator:</b>				
1.0	132 kV Bus post insulators	nos	30		



<b>i)</b>	<b>ERECTION &amp; MISCELLANEOUS MATERIALS</b>				
1.0	132 kV insulator strings, Disc insulator & accessories to complete the specified scope of works including for line tower	lot	1		
2.0	132 kV hardware, clamp, connectors & accessories to complete the specified scope of works including for line tower	lot	1		
3.0	ACSR "CARDINAL" conductors and accessories to complete the specified scope of works including re-stringing of conductor from old 132 DC tower to newly erected dead end tower.	LS	1		
4.0	Main Tubular bus including all other accessories required to complete 132 kV double bus-bar configuration	LS	1		
5.0	Identification plate, danger notice etc	LS	1		
<b>j)</b>	<b>Illumination System</b>				
1.0	Lighting system for outdoor Switchyard, Substation area, Entrance & Internal Road, Boundary wall periphery (with support if necessary ) as per technical specification	LS	1		
2.0	Emergency DC lighting system for switchyard	Nos	12		
<b>SUB TOTAL OF ELECTRICAL WORKS</b>					
<b>B)</b>	<b><i>SUBSTATION AUTOMATION/ COMMUNICATION / SCADA (Based on IEC 61850)</i></b>				
<b>C)</b>	<b><i>CIVIL WORKS</i></b>				
1	<b>Steel structure for post, beam and equipment supporting frame complete with bolts, fastner, pack washer, nuts, guest paltes and all accessories: (For 132 and 33 kV side)</b>				
1.1	132 kV take off gantry structures	LS	1		

1.2	132 kV internal gantry structures	LS	1		
1.3	132 kV SF6 gas circuit breaker	sets	2		
1.4	132 kV disconnecting switch with earth switch	sets	2		
1.5	132 kV disconnecting switch without earth switch	sets	4		
1.6	132 kV voltage transformer	nos	12		
1.7	132 kV current transformer	nos	6		
1.8	120 kV surge arrestor	nos	6		
1.9	132 kV Bus post insulator	nos	30		
1.10	132 kV double circuit dead end tower	nos	1		
1.11	Supply and fitting of switchyard fence including 2 nos gate/s including fence, pole and gate supply and civil works as per specification & drawing	RM	150		
1.12	Lightning/Earth Mast	Set	2		
	<b>SUB TOTAL OF STEEL STRUCTURAL WORKS</b>				
<b>2.0</b>	<b>Concrete Foundation for equipments and Steel Structures complete with excavation, backfilling, form works, lean concrete works and reinforcement bars:</b>				
2.1	132 kV take off gantry structures	LS	1		
2.2	132 kV internal gantry structures	LS	1		
2.3	132 kV SF6 gas circuit breaker	sets	2		
2.4	132 kV disconnecting switch with earth switch	sets	2		
2.5	132 kV disconnecting switch without earth switch	sets	4		
2.6	132 kV capacitor voltage transformer	nos	12		
2.7	132 kV current transformer	nos	6		

2.8	120 kV surge arrester	nos	6		
2.9	132 kV Bus post insulator	nos	30		
2.10	Lightning/Earth Mast	Set	2		
2.11	132 kV double circuit dead end tower complete as per attached drawing	nos	1		
2.12	Cable Trench, Duct Bank, Conduit and Hand hole and cable trays to complete the specified job	LS	1		
2.13	Complete Drains system including RCC slab cover	LS	1		
<b>3.0</b>	<b>Miscellaneous works:</b>				
3.1	Site grading with earth filling by borrow pit earth including compaction and leveling etc all to complete the specified works as per technical specification	Cu.M	500		
3.2	Crushed rock surfacing including laying of sand and plastic as per technical specifications	Cu.M	500		
3.3	M20 Conc. Nominal Mix 1:1.5:3 for protection work.	Cub m	25		
3.4	Reinforcement Bars	Kg	7850		
	<b>SUB TOTAL OF C except Steel</b>				
D)	<i>Maintain all settings for integration of incoming cardinal line from Khungri S/S with existing bear Conductor system at Ghorahi substation maintaining all necessary synchronization as per requirement all complete.</i>	LS	1		
<b>TOTAL OF SCHEDULE 4(a)</b>					

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**Price Schedule for Ghorahi Substation**

**Schedule No. 4(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 (US \$)	Total Training Charges in NRs
		1	2	3	4	5	6 = 3x4x5
A	NOT APPLICABLE						
<b>Total for Training Charges</b>							

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**Schedule No. 4 (c) : Training Charges for training to be imparted in Nepal**

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 (US \$)	Total Training Charges in NRs
		1	2	3	4	5	6 = 3x4x5
A	NOT APPLICABLE						
<b>Total for Training Charges</b>							

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**Schedule No. 4 (d) : Maintenance**

Sl. No.	Description	unit	Quantity	Total	
				Currency (US \$)	Total NRs
		1	2	3	4 = 2*3
A	NOT APPLICABLE				
				<b>Total</b>	