



**Procurement of Plant Design, Supply, Delivery, Installation, Testing and
Commissioning of
Lot 1: 400 kV Ratmate Substation and works at Lapsiphedhi and New
Hetauda Substations
Lot 2: 400 kV
New Butwal Substation
Lot 3: 400 kV New Damauli Substation**

MCA-N/ETP/CB/004

**ADDENDUM #10
Issued on: 26 September 2023**

This Addendum No. 10 modifies respective portions of the Bidding Document issued on 24 March 2023 and amended through Addendum No. 1 on 04 April 2023, Addendum No. 2 on 30 May 2023, Addendum No. 3 on 06 June 2023, Addendum No. 4 on 10 July 2023, Addendum No. 5 on 12 July 2023, Addendum No. 6 on 18 July 2023, Addendum No. 7 on 17 August 2023, Addendum No. 8 on 24 August 2023 and Addendum No. 9 on 04 September 2023. The changes, as indicated below, are effective on the date of issue of this Addendum.

Except as expressly amended by this Addendum, all other terms and conditions of the Bidding Document - issued on 24 March 2023 and amended through Addendum No. 1 issued on 04 April 2023, Addendum No. 2 on 30 May 2023, Addendum No. 3 on 06 June 2023, Addendum No. 4 on 10 July 2023, Addendum No. 5 on 12 July 2023, Addendum No. 6 on 18 July 2023, Addendum No. 7 on 17 August 2023, Addendum No. 8 on 24 August 2023 and Addendum No. 9 on 04 September 2023 remains unchanged and shall remain in full force and effect in accordance with their terms.

SN	Pages/Paragraph	Amendments	
1	Part 1: PDF Page 657 to 955 of 1019), Section IV. Bid Submission Forms, PRICE SCHEDULE	The Price Schedules is amended as per Attachment #1 to this Addendum #10.	
2	Part 1: Page 2, Specific Procurement Notice (SPN), Submission Deadline, Addenda 3,5 and 7 of the Bidding Document	Submission Deadline	05 October 2023
has been replaced by:		Submission Deadline	19 October 2023

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Part 1: Page 3,
Specific
Procurement
Notice (SPN),
Addenda 3,5 and
7 of the Bidding
Document

Bids must be delivered to the address below on or before **13:00 hours (local time of Nepal (GMT+5:45)) on 05 October 2023**. Electronic bidding will not be permitted. Late bids will be rejected. Bids will be publicly opened in the presence of the bidders' designated representatives and anyone who choose to attend at the address below on **05 October 2023 at 13:00 hours (local time of Nepal (GMT+5:45))**. All bids shall be accompanied by a *Bid Security* in the amount of **US\$425,000 for Lot 1, US\$260,000 for Lot 2 and US\$270,000 for Lot 3 and it shall be valid until 29 June 2024**.

Contact information:

The address(es) referred to above is (are):	The specific location/venue for submission of bids will be timely notified to all registered bidders via email and posted at MCA-Nepal web page.
Attn:	Procurement Agent
E-mail:	MCANepalPA@dt-global.com
Website:	https://mcanp.org/

has been replaced by:

Bids must be delivered to the address below on or before **13:00 hours (local time of Nepal (GMT+5:45)) on 19 October 2023**. Electronic bidding will not be permitted. Late bids will be rejected. Bids will be publicly opened in the presence of the bidders' designated representatives and anyone who choose to attend at the address below on **19 October 2023 at 13:00 hours (local time of Nepal (GMT+5:45))**. All bids shall be accompanied by a *Bid Security* in the amount of **US\$425,000 for Lot 1, US\$260,000 for Lot 2 and US\$270,000 for Lot 3 and it shall be valid until 13 July 2024**.

Contact information:




The address(es) referred to above is (are):	The specific location/venue for submission of bids will be timely notified to all registered bidders via email and posted at MCA-Nepal web page.
Attn:	Procurement Agent
E-mail:	MCANepalPA@dt-global.com
Website:	https://mcanp.org/

<p>4</p>	<p>Part 1: Page 47 & 48, Section II. Bid Data Sheet, ITB 8.1, Addenda 3,5 and 7 of the Bidding Document</p>	<p>To request clarification of this Bidding Document only, the Employer’s address is:</p> <p>Attention: Procurement Agent of Millennium Challenge Account Nepal Address: 2nd& 3rd Floor, East Wing, Lal Durbar Convention Centre, Yak & Yeti Complex, Durbar Marg, Kathmandu Nepal</p> <p>Email: MCANepalPA@dt-global.com</p> <p>Clarifications may be requested by e-mail not later than 45 days (21 August 2023) before the deadline for Bid submission, so that responses to the last set of requests for clarifications received can be issued to all Bidders not later than 30 days (05 September 2023) before the deadline for Bid submission.</p> <p>has been replaced by:</p> <p>To request clarification of this Bidding Document only, the Employer’s address is:</p> <p>Attention: Procurement Agent of Millennium Challenge Account Nepal Address: 2nd& 3rd Floor, East Wing, Lal Durbar Convention Centre, Yak & Yeti Complex, Durbar Marg, Kathmandu Nepal</p> <p>Email: MCANepalPA@dt-global.com</p> <p>Clarifications may be requested by e-mail not later than 59 days (21 August 2023) before the deadline for Bid submission, so that responses to the last set of requests for clarifications received can be issued to all Bidders not later than 20 days (29 September 2023) before the deadline for Bid submission.</p>
<p>6</p>	<p>Part 1: Page 52, Section II. Bid Data Sheet, ITB 19.1, Addenda 3,5 and 7 of the Bidding Document</p>	<p>The Bid validity period shall be 240 days, until 01 June 2024.</p> <p>Has been replaced by:</p> <p>The Bid validity period shall be 240 days, until 15 June 2024.</p>

<p>7</p>	<p>Part 1: Page 53, Section II. Bid Data Sheet, ITB 23.1, Addenda 3,5 and 7 of the Bidding Document</p>	<p>The address for Bid submission is: Attention: Procurement Agent of Millennium Challenge Account Nepal The specific location/venue for submission of bids will be timely notified to all registered bidders and posted at MCA-Nepal web page. The deadline for Bid submission is: Date: 05 October 2023 Time: 13:00 hours (local time of Nepal (GMT+5:45))</p> <p>has been replaced by:</p> <p>The address for Bid submission is: Attention: Procurement Agent of Millennium Challenge Account Nepal The specific location/venue for submission of bids will be timely notified to all registered bidders and posted at MCA-Nepal web page. The deadline for Bid submission is: Date: 19 October 2023 Time: 13:00 hours (local time of Nepal (GMT+5:45))</p>
<p>8</p>	<p>Part 1: Page 53 & 54, Section II. Bid Data Sheet, ITB 26.1, Addenda 3,5 and 7 of the Bidding Document</p>	<p>The Bid opening shall take place at: The specific location/venue for the bids opening will be timely notified to all registered bidders via email and posted at MCA-Nepal web page.</p> <p>Date: 05 October 2023 Time: 13:00 hours (local time of Nepal (GMT+5:45))</p> <p>has been replaced by:</p> <p>The Bid opening shall take place at: The specific location/venue for the bids opening will be timely notified to all registered bidders via email and posted at MCA-Nepal web page.</p> <p>Date: 19 October 2023 Time: 13:00 hours (local time of Nepal (GMT+5:45))</p>

Attachment#1

Price Schedules

<u>Lots</u>	<u>Price Schedule</u>
<u>Lot 1</u>	 230913_Lot1_RAT_P S_Rep.pdf
<u>Lot 2</u>	 230913_Lot2_NBW_ PS.pdf
<u>Lot 3</u>	 230913_Lot3_NDM_ PS.pdf

Lot 1 Price Schedule

Millennium Challenge Account Nepal
Procurement of Plant Design, Supply, Delivery, Installation, Testing and Commissioning of
Lot 1: 400kV Ratmate Substation and works at Lapsiphedhi and New Hetauda Substations
Price Schedule

Breakdown of Rates and Price Schedule No. 1. Design Services					
Item No	Description	Qty	Unit	Unit Rate	Total Price
		1		US\$ 2	US\$ (1)x(2)
1.1	Design Works (Electrical)				
Complete Electromechanical and Electrical Design of New Substation as Specified in Scope and Employers Requirements including					
1.1.1	Substation Design: (SLD, Layout, Section elevation, P&C, SCADA, 400/220kV Switchgear, Auto Transformers along with connections, Auxiliary System, Control, LV & Fibre Optic Cables along with connections for the same, etc.)	1	Lot		
1.1.2	Thermal Calculations for normal and emergency continuous current ratings of the switchgear and each main current path component.	1	Lot		
1.1.3	Insulation Coordination Study	1	Lot		
1.1.4	Lightning Surge Overvoltage Study	1	Lot		
1.1.5	Transient Recovery Voltage (TRV) Study for GIS	1	Lot		
1.1.6	Grounding analysis for entire substation (Includes ERT)	1	Lot		
1.1.7	All the requested settings for Protection Coordination, Relay Test Plan, Configuration and Programming on Intelligent Electronic Device (IEDs) such as Relays, RTUs, Automation system, etc. to ensure normal function of integrated system at substation and with other facilities in the entire power system as referred to Lot 1 works	1	Lot		
1.1.8	GIS system earthing and bonding study	1	Lot		
1.1.9	Outdoor Switchyard Lighting Study	1	Lot		
1.1.10	Power Cable Ampacity Study	1	Lot		
1.1.11	Rigid Bus Study	1	Lot		
1.1.12	Power Cable Pulling Tension Calculation	1	Lot		
1.1.13	Any other design work not specifically mentioned above but deemed necessary or as required by Engineer/Employer for satisfactory completion of design work.	1	Lot		
Sub Total 1.1					
1.2	Design Works (Civil)				
Complete Civil Design of New Substation as Specified in Scope and Employers Requirements including but not limited to:					
1.2.1	Geotechnical investigation data and drawings including on-site support during excavation and compaction.	1	Lot		
1.2.2	Hydrological study to carryout a flood risk assessment	1	Lot		
1.2.3	Surveying and benchmarking design and drawings including on-site support during site preparation.	1	Lot		
1.2.4	Substation Design in Civil, Structural, Mechanical and Architectural, such as foundation works, hot dip galvanised steel supporting structures for all outdoor electrical equipment, other civil works like boundary wall etc., substation buildings, roads, cable trenches, water drainage system, oil containment chamber and sump pit, fire walls etc. of new substation complete in all respect.	1	Lot		
1.2.5	Design of rail tracks for movement of power transformers on the reinforced concrete foundations.	1	Lot		
1.2.6	Any Architectural-Related Calculations and Analysis	1	Lot		
1.2.7	Any Mechanical-Related Calculations and Analysis	1	Lot		
1.2.8	Any other design work not specifically mentioned above but deemed necessary or as required by Engineer/Employer for satisfactory completion of design work.	1	Lot		
Sub Total 1.2					
Total (Carried forward to Grand SC-5)					
Name of Bidder:					
Signature of Bidder:					

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied

Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
2.1	AIS HV and MV Equipment				
2.1.1	167 MVA, (400/√3/220/√3/33) kV, Single Phase Auto-Transformer with OLTC, RTCC Facility, Surge protection arrangement (AIS) for HV, IV and LV side and with Bushing CT complete with all accessories as specified	7	Nos		
2.1.2	Capacitor Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	18	Nos		
2.1.3	Current Transformer (CT), 400kV, Single Phase, Live Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	18	Nos		
2.1.4	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
2.1.5	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	18	Nos		
2.1.6	Station Service Transformer, 630 kVA, 33/0.4kV	2	Nos		
2.1.7	30kV,10kA Lightning arrester for 33kV line bays	6	Nos		
2.1.8	30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
2.1.9	72.5kV Double Break Isolator, Single Phase	1	Lot		
2.1.10	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
2.1.11	72.5kV Current Transformer	6	Nos.		
2.1.12	400kV Bus Support Post Insulator	1	Lot		
2.1.13	220kV Bus Support Post Insulator	1	Lot		
2.1.14	72.5kV Bus Support Post Insulator	1	Lot		
2.1.15	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
2.1.16	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.1					
2.2	Hot-Dip Galvanized Steel				
2.2.1	Gantry Column for 400 kV Incoming Line	7	Nos		
2.2.2	Gantry Girder for 400 kV Incoming Line	6	Nos		
2.2.3	Support Structure for 400 kV Current Transformer	18	Nos		
2.2.4	Support Structure for 400 kV Capacitive Voltage Transformer	18	Nos		
2.2.5	Support Structure for 400 kV Surge Arrester	18	Nos		
2.2.6	Support Structure for 400 kV Bus Support	1	Lot		
2.2.7	Support Structure for 220 kV Bus Support	1	Lot		
2.2.8	Support Structure for 72.5 kV Current Transformer	6	Nos		
2.2.9	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
2.2.10	Support Structure for 72.5 kV Single Switch Stand	1	Lot		
2.2.11	Support Structure for 30kV Lightning Arrester	12	Nos		
2.2.12	Structures for Lightning Mast and other Lighting structures	1	Lot		
2.2.13	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.2					
2.3	Bus Bar and Overhead Connections				
2.3.1	5" AL. Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
2.3.2	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		
2.3.3	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		
2.3.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.3					
2.4	LV Control and Power Cable				
2.4.1	LV Control Cables	1	Lot		
2.4.2	LV Power Cables	1	Lot		
2.4.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		

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Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		1	2	3	(1) x (3)
2.4.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		
2.4.5	33 kV Cable Pothead	1	Lot		
2.4.6	Power Cable for Filter Plant (Transformer) 3.5CX240 sq.mm. (Armoured, PVC Insulated) with suitable termination arrangement all complete	1	Lot		
2.4.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
2.4.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.4					
2.5	AC AND DC STATION SUPPLY				
2.5.1	400 V AC Main Switch Board				
2.5.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
2.5.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
2.5.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
2.5.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
2.5.2	400 V AC Main Lighting Board				
2.5.2.1	100kVA Lighting Transformer	2	Nos		
2.5.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
2.5.3	400 V AC Emergency Lighting Distribution Board				
2.5.3.1	100kVA Lighting Transformer	1	Nos		
2.5.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A Breaker	1	Nos		
2.5.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers	1	Nos		

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied

Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		1	2	3	(1) x (3)
2.5.4	400 V AC Distribution Board				
2.5.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
2.5.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
2.5.4.3	400/1A Current Transformer, Class 5P20	1	Nos		
2.5.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers	1	Nos		
2.5.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		
2.5.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
2.5.5	400 V AC AMF Panel				
2.5.5.1	400/1A Current Transformer, Class 1	3	Nos		
2.5.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
2.5.6	DC Chargers and Batteries				
2.5.6.1	220V Battery Charger (Float/Boost)	6	Nos		
2.5.6.2	48V Battery charger (Float/Boost)	6	Nos		
2.5.6.3	250A Throw over Switch, Interlock	12	Nos		
2.5.6.4	Battery, 220Vdc, 108 Minimum Cells	4	Nos		
2.5.6.5	Battery, 48Vdc, 24 Minimum Cells	4	Nos		
2.5.7	DC Distribution Boards				
2.5.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	6	Nos		
2.5.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	4	Nos		
2.5.7.3	DC Fuse Box, 220Vdc	1	Lot		
2.5.7.4	DC Fuse Box, 48Vdc	1	Lot		
2.5.8	Other Equipment				
2.5.8.1	Diesel Generator Set, 250kVA (Including Fuel Tank) and all accessories	1	Nos		
2.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.5					
2.6	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
2.6.1	Line/Feeder Bay-400 kV				
2.6.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	10	Nos		
2.6.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
2.6.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
2.6.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
2.6.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	10	Nos		
2.6.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set (1 set = 3	10	Nos		
2.6.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	10	Nos		
2.6.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA,	10	Nos		
2.6.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	10	Nos		
2.6.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	10	Nos		

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Price Schedule

Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied

Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		1	2	3	(1) x (3)
2.6.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
2.6.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
2.6.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
2.6.1.14	Gas Insulated bus (GIB) with required GIS Termination along with supports for GIB run for whole Line/Feeder Bay (Three phase set)	10	Bays		
2.6.2	Transformer Bay-400 kV				
2.6.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
2.6.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set ((1 set = 3 single phase)	8	Nos		
2.6.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
2.6.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set(1 set = 3 single phase)	8	Nos		
2.6.2.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	3	Nos		
2.6.2.6	Voltage Transformers, 400kV, dual secondary, earthing link, single-phase, three-phase set(1 set = 3 single phase)	3	Nos		
2.6.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	6	Nos		
2.6.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	6	Nos		
2.6.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
2.6.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
2.6.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
2.6.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
2.6.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
2.6.2.14	Isolating & Earthing Switches, 400kV, 4000A, 50kA Single phase, and Auxiliary Gas Insulated Bus (GIB) for Spare Transformer Operation, GIS to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete. 33kV isolators, 33kV cables , jumpers as required all complete	3	Set		
2.6.2.15	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination Bushing along with supports for GIB run for whole Transformer Bay Lot	3	Bays		
2.6.3	Diameter Middle Breaker Bay-400 kV				
2.6.3.1	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	4	Nos		
2.6.3.2	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	2	Nos		
2.6.3.3	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set ((1 set = 3 single phase)	12	Nos		
2.6.3.4	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		

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Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		1	2	3	(1) x (3)
2.6.3.5	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	12	Nos		
2.6.3.6	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
2.6.3.7	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
2.6.3.8	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
2.6.3.9	All metallic structures and supports required for GIS complete with accessories	1	Lot		
2.6.3.10	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
2.6.4	Gas Insulated BUSBAR				
2.6.4.1	400kV, Double Bus Bar of 3 single phase (isolated), SF6 gas insulated, metal enclosed 4000A bus bars each enclosed in three individual bus enclosures per diameter	7	Diameter		
2.6.4.2	Voltage Transformers, 400kV, dual secondary, single-phase, three-phase set ((1 set = 3 single phase)	2	Nos		
2.6.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	2	Nos		
2.6.4.4	Main Bus Bar Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	2	Nos		
2.6.4.5	Bus Bar Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set ((1 set = 3 single	2	Nos		
2.6.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.6					
2.7	220kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
2.7.1	Line/Feeder Bay-220 kV				
2.7.1.1	SF6 Circuit Breaker, 220kV, 4000A, 50kA, Three Pole	8	Nos		
2.7.1.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set ((1 set = 3 single phase)	16	Nos		
2.7.1.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
2.7.1.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
2.7.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
2.7.1.6	Voltage Transformers, 220kV, dual secondary, with earthing link, single-phase, three-phase set (1 set = 3 single	8	Nos		
2.7.1.7	Line/Feeder Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
2.7.1.8	Line/Feeder Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set	8	Nos		
2.7.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	8	Nos		
2.7.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	8	Nos		
2.7.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
2.7.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
2.7.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		

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Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		1	2	3	(1) x (3)
2.7.1.14	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for the whole Line/Feeder	8	Bays		
2.7.2	Transformer Bay-220 kV				
2.7.2.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole.	6	Nos		
2.7.2.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set	12	Nos		
2.7.2.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set	12	Nos		
2.7.2.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set	12	Nos		
2.7.2.5	Transformer High Speed Earthing Switches, with removable earthing link 220kV, 50kA, single-phase, three-	5	Nos		
2.7.2.6	Voltage Transformers, 220kV, dual secondary, with earthing link, single-phase, three-phase set	5	Nos		
2.7.2.7	Transformer Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set	8	Nos		
2.7.2.8	Transformer Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set	8	Nos		
2.7.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
2.7.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
2.7.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
2.7.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
2.7.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
2.7.2.14	Isolating & Earthing Switches, 220kV, 4000A, 50kA, Single phase, and Gas Insulated Bus (GIB) for Spare Transformer, with auxiliary Bus, GIS to AIS Bushing termination, jumpers, required CT, AI. tube, metering, control and protection as required all complete.	3	Set		
2.7.2.15	Three Single Phase Gas Insulated Bus (GIB) and required GIS Termination along with supports for GIB run for the whole Transformer Bay	6	Bays		
2.7.3	Middle Diameter Breaker Bay -220 kV				
2.7.3.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole.	6	Nos		
2.7.3.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set	12	Nos		
2.7.3.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set	12	Nos		
2.7.3.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set	12	Nos		
2.7.3.5	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
2.7.3.6	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
2.7.3.7	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
2.7.3.8	All metallic structures and supports required for GIS complete with accessories	1	Lot		
2.7.3.9	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
2.7.4	Gas Insulated Bus Bars				

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		1	2	3	(1) x (3)
2.7.4.1	220kV , Double 3 single phase (isolated), SF6 gas insulated , metal enclosed 4000A bus bars each enclosed in three individual bus enclosures per diameter	7	Diameter		
2.7.4.2	Voltage Transformers, 220kV, dual secondary, single-phase, three-phase set	2	Nos		
2.7.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 220kV, 50kA, Single-phase, Three-phase set	2	Nos		
2.7.4.4	Bus Bar Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	2	Nos		
2.7.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.7					
2.8	Complete with control & protection up to GIB sealing end for all Feeder				
2.8.1	Complete set of Control and Protection panels for 400 kV station as				
2.8.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	12	Nos		
2.8.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)	12	Nos		
2.8.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	4	Nos		
2.8.1.4	400kV (Double Bus Bar Protection)	2	Set		
2.8.1.5	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
2.8.2	Complete set of Control and Protection panels for 220 kV station as				
2.8.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the relay panel)	6	Nos		
2.8.2.2	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	4	Nos		
2.8.2.3	220kV (Double Bus Bar Protection)	2	Set		
2.8.2.4	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
2.8.3	Complete set of Control and Protection panels for 33 kV station as				
2.8.3.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
2.8.3.2	Transformer Protection Panel	2	Nos		
2.8.3.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
2.8.4	Substation Automation & Metering System				
2.8.4.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
2.8.4.2	Substation Automation System (SAS) for 400 kV System per diameter	7	Set		
2.8.4.3	Substation Automation System (SAS) for 220kV System per diameter	7	Set		
2.8.4.4	Substation Automation System (SAS) for 33kV System per feeder	2	Set		
2.8.4.5	Substation Automation System (SAS) for Auxiliary System	1	Set		
2.8.4.6	Integration of all 400/220kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
2.8.4.7	Telecommunication system for Ratmate	1	Lot		
2.8.4.8	Fibre Optic SDH System	1	Lot		
2.8.4.9	Phone System	1	Lot		
2.8.4.10	400 kV Metering	1	Lot		
2.8.4.11	220kV Metering	1	Lot		
2.8.4.12	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
Sub Total 2.8					
2.9	Grounding System				

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				US\$	US\$
				DDP plus all related cost as defined in foot note	
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
2.9.1	Stranded Bare Copper 240 Sq. mm*** Grid (Including Fusion and Mechanical Connectors)	1	Lot		
2.9.2	Grounding Rods	1	Lot		
2.9.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
2.9.4	Embedded Grounding System - 220kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
2.9.5	Embedded Grounding System - Control Room	1	Lot		
2.9.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.9					
2.10	Lightning Protection System				
2.10.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
2.10.2	Lightening Mast as required for total protection of	1	Lot		
2.10.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.10					
2.11	Firefighting System				
2.11.1	Fire protection/detection for 7 (Seven) auto transformers	1	Lot		
2.11.2	Fire protection/detection for 400kV GIS Building	1	Lot		
2.11.3	Fire protection/detection for 220kV GIS Building	1	Lot		
2.11.4	Fire protection/detection for Control House	1	Lot		
2.11.5	Fire protection/detection system for pump house building	1	Lot		
2.11.6	Fire protection/detection system for generator diesel tank	1	Lot		
2.11.7	Portable fire extinguishers	1	Lot		
2.11.8	Clean-agent fire extinguishers	1	Lot		
2.11.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.11					
2.12	HVAC And Ventilation Systems				
2.12.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
2.12.2	220kV GIS Building HVAC and Ventilation Systems	1	Lot		
2.12.3	Control House HVAC and Ventilation Systems	1	Lot		
Sub Total 2.12					
2.13	Accessories and Ancillary Material				
2.13.1	Junction and marshalling boxes, outdoor	1	Lot		
2.13.2	Junction and marshalling boxes, indoor	1	Lot		
2.13.3	Outdoor lighting, including lighting fixtures	1	Lot		
2.13.4	Indoor lighting, including lighting fixtures	1	Lot		
2.13.5	Control Cabinet for outdoor lighting	1	Lot		
2.13.6	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
2.13.7	Electric Overhead Travelling Crane for installation and removal of GIS Equipment (For 400 and 220 kV each)	2	Lot		
2.13.8	Visual Monitoring System	1	Lot		
2.13.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.13					
2.14	Mandatory Maintenance, Repair tools and Testing Instruments				
2.14.1	GIS Equipment				
2.14.1.1	400kV GIS SF6 leakage detector, analyzer and processing unit all complete	1	Lot		
2.14.1.2	220kV GIS SF6 leakage detector, analyzer and processing unit all complete	1	Lot		
2.14.1.3	400kV GIS Wrenches and tools	1	Lot		
2.14.1.4	220kV GIS Wrenches and tools	1	Lot		
2.14.1.5	400kV GIS Pressure gauge	1	Nos		
2.14.1.6	220kV GIS Pressure gauge	1	Nos		
2.14.1.7	400kV GIS Gas sampling and moisture meter	1	Nos		

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		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
2.14.1.8	220kV GIS Gas sampling and moisture meter	1	Nos		
2.14.1.9	400kV GIS Micro-Ohmmeter	1	Nos		
2.14.1.10	220kV GIS Micro-Ohmmeter	1	Nos		
2.14.1.11	400kV GIS Circuit-breaker, timing tester	1	Nos		
2.14.1.12	220kV GIS Circuit-breaker, timing tester	1	Nos		
2.14.1.13	400kV GIS Laptop computer with specialized software for GIS setting and monitoring	1	Nos		
2.14.1.14	220kV GIS Laptop computer with specialized software for GIS setting and monitoring	1	Nos		
2.14.1.15	Complete set of SF6 gas service cart mounted on a trailer for mobile application. SF6 gas refilling cart equipped with 1 SF6 gas cylinder and the necessary instruments and adapters for easy and quick gas refilling in case of losses	1	Lot		
2.14.1.16	HV Test Bushing for GIS	1	Lot		
2.14.1.17	Online Partial Discharge Monitoring System	1	Nos		
2.14.2	Auto Transformer & Station Service Transformer				
2.14.2.1	Oil-treatment unit 6000lph along with suitable size and quantity of connection arrangement (MCCB (240-300 Amp),terminal lugs etc.) all complete (autotransformer)	1	Nos		
2.14.2.2	Oil dielectric tester	1	Nos		
2.14.2.3	Dielectric tester based on tan δ and dielectric losses , 10 kV	1	Nos		
2.14.2.4	Megger, electronic, 5 kV	1	Nos		
2.14.2.5	Wrenches and tools	1	Lot		
2.14.3	Complete set of Control and Protection for Sub-Station				
2.14.3.1	Relay Test kit	1	Lot		
2.14.3.2	Test Equipment & tools for SAS SYSTEM for measuring, configuration & diagnostics.	1	Lot		
Sub Total 2.14					
2.15	Mandatory Spare Parts				
2.15.1	HV Equipment				
2.15.1.1	Unit of 400kV surge arrester, complete with grading ring, terminals and surge counter	2	Nos		
2.15.1.2	Capacitive voltage transformer, 400kV	1	Nos		
2.15.1.3	Current transformer, 400kV	1	Nos		
2.15.1.4	Current transformer, 72.5kV	1	Nos		
2.15.2	Auto Transformer				
2.15.2.1	Complete set of gaskets with grease, for cover, manholes, hand holes, and pipping fittings.	2	Lot		
2.15.2.2	Lot of LV control and protective components, minimum one unit of each type of components used	2	Lot		
2.15.2.3	Pressure relief device, complete with accessories	2	Nos		
2.15.2.4	Bushings, one complete unit of each type used, with accessories	2	Lot		
2.15.2.5	Current transformer, one unit of each type	2	Lot		
2.15.2.6	Oil-circulating pump with motor, complete with accessories	2	Nos		
2.15.2.7	Cooling fan, complete with motor	2	Nos		
2.15.2.8	Buchholz relay, complete (2 each for main tank and OLTC tank)	4	Nos		
2.15.2.9	One instrument of each type used (temperature, oil level, pressure vent, etc.)	2	Lot		
2.15.2.10	One valve of each type used	2	Lot		
2.15.2.11	Insulating oil, 5% of the volume used	1	Lot		
2.15.2.12	Silica gel, quantity for one load	1	Lot		
2.15.2.13	Tap changer diverter switch, spare contacts and transition resistance	2	Lot		
2.15.2.14	Tap changer selector switch spare contacts	2	Lot		
2.15.2.15	Rolls of Kraft insulating paper	2	Lot		
2.15.2.16	LA for HV,IV and LV side each	2	Lot		

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		1	2	3	(1) x (3)
2.15.2.17	Additional spare parts as per Chapter 3: Auto Transformer Specification of Part 2: Employer's Requirements, Section V – B1 (Technical Specifications).	1	Lot		
2.15.3	630kVA Transformer				
2.15.3.1	All Bushing with metal parts (each voltage rating) for 630 kVA Transformer	1	Lot		
2.15.3.2	Oil Temperature Indicator with sensing device	1	Lot		
2.15.3.3	Tap Changer Contacts	1	Lot		
2.15.3.4	Buchholz Relay	1	Nos		
2.15.3.5	Explosion vent diaphragm	1	Nos		
2.15.3.6	Set of valve (each type)	1	Lot		
2.15.3.7	3-Phase 11 kV Horn Gap Fuse	1	Lot		
2.15.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.15					
2.16	Spare Parts for AC and DC Station Supply				
2.16.1	Spare for LV Switchgear				
2.16.1.1	LV circuit breaker, complete, with CT's and protection devices	1	Lot		
2.16.1.2	Outgoing thermomagnetic breakers - one unit of each type used	1	Lot		
2.16.1.3	Metering - one instrument of each type used	1	Lot		
2.16.1.4	Protection (other than included in LV breaker) One unit of each type used	1	Lot		
2.16.1.5	Automatic Transfer Switch One complete controller including sensors	1	Nos		
2.16.1.6	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc	1	Lot		
2.16.2	Spare for DC Distribution Panels				
2.16.2.1	Thermomagnetic breakers one unit of each type used	1	Lot		
2.16.2.2	Metering - one metering instrument of each type used	1	Lot		
2.16.2.3	Protection (other than included in LV breaker) One unit of each type used	1	Lot		
2.16.2.4	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc	1	Lot		
2.16.3	Spare for Diesel Generator Set				
2.16.3.1	Replaceable elements for air filter	1	Nos		
2.16.3.2	Replaceable elements for oil filter	1	Nos		
2.16.3.3	Replaceable elements for fuel filter	1	Nos		
2.16.3.4	Complete set of injectors	1	Nos		
2.16.3.5	Fuel injector pump	1	Nos		
2.16.3.6	Oil pump	1	Nos		
2.16.3.7	Intake valves	1	Nos		
2.16.3.8	Seats for intake valves	1	Nos		
2.16.3.9	Exhaust valves	1	Nos		
2.16.3.10	Set for exhaust valves	1	Nos		
2.16.3.11	Disconnect switch, with grounding blades, 220 kV, 3 Ø	1	Nos		
2.16.3.12	Set of pistons	1	Nos		
2.16.3.13	Set of complete bearings of the engine	1	Nos		
2.16.3.14	Set of all gaskets needed for the engine	1	Nos		
2.16.3.15	Set of thermostats	1	Nos		
2.16.3.16	Set of bearings for the alternator	1	Nos		
2.16.3.17	Set of control cards, at least one unit of each type used	1	Lot		
2.16.3.18	Diodes and thyristors of each type used	3	Nos		
2.16.3.19	Lamp, one unit of each type used	10	Nos		
2.16.3.20	Auxiliary relay, one unit of each type used	1	Lot		
2.16.3.21	Multifunction metering instrument	1	Nos		
2.16.3.22	Voltage and speed regulator component and actuator	1	Nos		
2.16.3.23	Controller components	1	Nos		
2.16.3.24	Instrument, detectors	1	Nos		

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		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
2.16.4	Spare for Batteries				
2.16.4.1	One unit of battery used in 220 V DC system	1	Nos		
2.16.4.2	Loose parts for 220 V DC - connection elements, cables, links, etc.	1	Lot		
2.16.4.3	One unit of battery used in 48 Vdc system	1	Nos		
2.16.4.4	Loose parts for 48 V DC - connection elements, cables, links, etc.	1	Lot		
2.16.5	Spare for Battery Chargers				
2.16.5.1	Complete bridge of thyristors assembled on a cooling base	1	Nos		
2.16.5.2	Controller, complete including each type of card used	1	Nos		
2.16.5.3	Loose elements - auxiliary relays, breakers, metering instruments, control switches, fuses, etc.	1	Lot		
2.16.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.16					
2.17	Mandatory spare parts - Miscellaneous material				
2.17.1	Junction and marshalling boxed, outdoor, one of each type used	1	Lot		
2.17.2	Junction and marshalling boxed, indoor, one of each type used	1	Lot		
2.17.3	Outdoor lighting fixture, one unit of each type used	1	Lot		
2.17.4	Post-type insulator, one unit of each type used	1	Lot		
2.17.5	Suspension insulator, 5% of the total used	1	Lot		
2.17.6	Bus bar (rigid and strain) hardware, including, connectors, terminals, separator, corona rings, 5% of each type used, minimum one unit	1	Lot		
2.17.7	Grounding conductors, 5% of the installed conductors (stranded copper conductor, rectangular-shape copper bar and grounding rod)	1	Lot		
2.17.8	Fission connection material, including molds, welding powder and installation tools, quantity required to make 5% of the total executed connections	1	Lot		
2.17.9	Mechanical connectors for grounding, 5% of the total executed connections	1	Lot		
2.17.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.17					
2.18	Mandatory spare parts for 400kV and 220kV GIS				
2.18.1	Spare Gas				
2.18.1.1	SF6 bottles required to fill the two largest volume compartments for 400kV and 220kV	2	Lot		
2.18.2	Circuit Breakers, 4000 A, 50kA (For 400kV)				
2.18.2.1	Circuit breaker, complete pole assembly	1	Lot		
2.18.2.2	Complete sets of main contacts	1	Lot		
2.18.2.3	Complete sets of arcing contacts	2	Lot		
2.18.2.4	Operating mechanism, complete	1	Lot		
2.18.2.5	Closing coils	10	Nos		
2.18.2.6	Tripping coils	10	Nos		
2.18.3	Circuit Breakers, 4000 A, 50kA (For 220kV)				
2.18.3.1	Circuit breaker, complete pole assembly	1	Lot		
2.18.3.2	Complete sets of main contacts	1	Lot		
2.18.3.3	Complete sets of arcing contacts	2	Lot		
2.18.3.4	Operating mechanism, complete	1	Lot		
2.18.3.5	Closing coils	10	Nos		
2.18.3.6	Tripping coils	10	Nos		
2.18.4	Disconnect-Switches, 4000 A (For 400kV)				
2.18.4.1	Disconnect-Switch, complete pole	1	Nos		
2.18.4.2	Complete set of contacts	2	Nos		
2.18.4.3	Operating mechanism, complete	1	Nos		
2.18.4.4	Operating mechanism motor	2	Nos		
2.18.5	Disconnect-Switches, 4000 A (For 220kV)				

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Item No.	Description	Qty.	Unit	Unit Rate (b) US\$	Total Price (c) US\$
		1	2	3	(1) x (3)
2.18.5.1	Disconnect-Switch, complete pole	1	Nos		
2.18.5.2	Complete set of contacts	2	Nos		
2.18.5.3	Operating mechanism, complete	1	Nos		
2.18.5.4	Operating mechanism motor	2	Nos		
2.18.6	Maintenance Earthing Switches (For 400kV)				
2.18.6.1	Earthing-Switch, complete pole	1	Lot		
2.18.6.2	Complete set of contacts	2	Nos		
2.18.6.3	Operating mechanism, complete	1	Lot		
2.18.6.4	Operating mechanism motor	2	Nos		
2.18.7	Maintenance Earthing Switches (For 220kV)				
2.18.7.1	Earthing-Switch, complete pole	1	Lot		
2.18.7.2	Complete set of contacts	2	Nos		
2.18.7.3	Operating mechanism, complete	1	Lot		
2.18.7.4	Operating mechanism motor	2	Nos		
2.18.8	High-speed earthing Switches (For 400kV)				
2.18.8.1	High-speed earthing switch, complete pole	1	Lot		
2.18.8.2	Complete set of contacts	2	Nos		
2.18.8.3	Operating mechanism, complete	1	Lot		
2.18.8.4	Operating mechanism motor	2	Nos		
2.18.9	High-speed earthing Switches (For 220kV)				
2.18.9.1	High-speed earthing switch, complete pole	1	Lot		
2.18.9.2	Complete set of contacts	2	Nos		
2.18.9.3	Operating mechanism, complete	1	Lot		
2.18.9.4	Operating mechanism motor	2	Nos		
2.18.10	Other Equipment				
2.18.10.1	Voltage transformer, 400 kV, complete with disconnecting and earthing switch	3	Nos		
2.18.10.2	Voltage transformer, 220 kV, complete with disconnecting and earthing switch	3	Nos		
2.18.10.3	Current transformer, metering core, loose part for 400kV	6	Nos		
2.18.10.4	Current transformer, metering core, loose part for 220kV	6	Nos		
2.18.10.5	Current transformer, protection core, loose part for 400kV	6	Nos		
2.18.10.6	Current transformer, protection core, loose part for 220kV	6	Nos		
2.18.11	400kV GIS and 220kV GIS Bay, Local Control Cabinet				
2.18.11.1	One Bay Local Control Cabinet complete, wired, with all specified devices	2	Lot		
2.18.12	Bus bar Elements (For 400kV)				
2.18.12.1	Bus conductor elements	2	Lot		
2.18.12.2	Bus connection elements	2	Lot		
2.18.12.3	GIS insulators, one of each type used	2	Lot		
2.18.12.4	Pressure relief elements	2	Lot		
2.18.13	Bus bar Elements (For 220kV)				
2.18.13.1	Bus conductor elements	2	Lot		
2.18.13.2	Bus connection elements	2	Lot		
2.18.13.3	GIS insulators, one of each type used	2	Lot		
2.18.13.4	Pressure relief elements	2	Lot		
2.18.14	SF6-to-Air Bushing Modules				
2.18.14.1	SF6-to-air bushing module, 400 kV, single phase	1	Lot		
2.18.14.2	SF6-to-air bushing module, 220 kV, single phase	1	Lot		
2.18.15	Loose Spare Parts				
2.18.15.1	5% of auxiliary relays, control devices, fuses, terminal blocks, etc. minimum one unit of each type used	2	Lot		
2.18.16	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.18					
2.19	Spare of LV control and power cables				
2.19.1	LV control cable, 5% of the installed cables	1	Lot		
2.19.2	LV power cable, 5% of the installed cables	1	Lot		
2.19.3	Cable installation accessories - 5% of the installed material	1	Lot		

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Item No.	Description	Qty.	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
2.19.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.19					
2.20	Spare parts of Mechanical Equipment				
2.20.1	Fire protection				
2.20.1.1	Fire protection/detection for auto transformer - one unit of each type used	1	Lot		
2.20.1.2	Clean-agent fire extinguisher	1	Lot		
2.20.1.3	Control building general fire protection/detection system, one unit of each component used	1	Lot		
2.20.1.4	GIS building general fire protection/detection system, one unit of each component used	1	Lot		
2.20.2	Control building HVAC system				
2.20.2.1	Throwaway air filters per air conditioning unit	1	Lot		
2.20.2.2	Pulley belts per air conditioning unit motor	1	Lot		
2.20.2.3	Thermostat per air conditioning unit	1	Lot		
2.20.3	GIS building ventilation system				
2.20.3.1	Throwaway air filters per ventilation system	1	Lot		
2.20.3.2	Pulley belts per ventilation unit motor	1	Lot		
2.20.3.3	Thermostat per ventilation unit	1	Lot		
2.20.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 2.20					
2.21	Works at New-Hetauda				
2.21.1	Approach cable and hardware for termination of OPGW including joint box of Ratmate – Hetauda D/C Lines at New Hetauda Substation End including necessary AC,DC and Interfacing cable for tele protection application. Addition to the above Telecommunication works should include connection, extension and configuration of the local and network remote fiber optic equipment and all works required for the connection, extension and configuration of the phone system as well as for tele	1	Lot		
Sub Total 2.21					
2.22	Works at Lapsiphedi				
2.22.1	Supply and installation of necessary approach cable and hardware for termination of OPGW of Ratmate – Lapsiphedi D/C Lines at Lapsiphedi Substation End, it's interfacing with existing DPC for tele protection application and necessary SDH, MUX/DMUX telecommunication terminal equipment required for the communication of the 400 kV Lines and its integrations with SAS at both end substations and SCADA system of the LDC. Addition to above Telecommunication works should include connection, extension and configuration of the local and network remote fiber optic equipment and all works required for the connection, configuration and extension of the phone system as well as for tele protection	1	Lot		
Sub Total 2.22					
Total (Carried forward to Grand SC-5)					
				Name of Bidder:	
				Signature of Bidder:	
Note:					
***:This value is indicative, the Contractor will validate as per item 1.1.6 of Design Works (Electrical)					

Country of Origin Declaration Form

Item No.	Description

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Item No.	Description	Qty.	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>

Note : Bidders shall enter the full name of the country of origin of all imported plant and equipment. Enter the code as per the

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.1	AIS HV and MV Equipment				
3.1.1	167 MVA, (400/√3/220/√3/33) kV, Single Phase Auto-Transformer with OLTC, RTCC Facility, Surge protection arrangement (AIS) for HV, IV and LV side and with Bushing CT complete with all accessories as specified	7	Nos		
3.1.2	Capacitor Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	18	Nos		
3.1.3	Current Transformer (CT), 400kV, Single Phase, Live Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	18	Nos		
3.1.4	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
3.1.5	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	18	Nos		
3.1.6	Station Service Transformer, 630 kVA, 33/0.4kV	2	Nos		
3.1.7	30kV,10kA Lightning arrester for 33kV line bays	6	Nos		
3.1.8	30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
3.1.9	72.5kV Double Break Isolator, Single Phase	1	Lot		
3.1.10	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
3.1.11	72.5kV Current Transformer	6	Nos.		
3.1.12	400kV Bus Support Post Insulator	1	Lot		
3.1.13	220kV Bus Support Post Insulator	1	Lot		
3.1.14	72.5kV Bus Support Post Insulator	1	Lot		
3.1.15	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
3.1.16	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 3.1	
3.2	Hot-Dip Galvanized Steel				
3.2.1	Gantry Column for 400 kV Incoming Line	7	Nos		
3.2.2	Gantry Girder for 400 kV Incoming Line	6	Nos		
3.2.3	Support Structure for 400 kV Current Transformer	18	Nos		
3.2.4	Support Structure for 400 kV Capacitive Voltage Transformer	18	Nos		
3.2.5	Support Structure for 400 kV Surge Arrester	18	Nos		
3.2.6	Support Structure for 400 kV Bus Support	1	Lot		
3.2.7	Support Structure for 220 kV Bus Support	1	Lot		
3.2.8	Support Structure for 72.5 kV Current Transformer	6	Nos		
3.2.9	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
3.2.10	Support Structure for 72.5 kV Single Switch Stand	1	Lot		
3.2.11	Support Structure for 30kV Lightning Arrester	12	Nos		
3.2.12	Structures for Lightning Mast and other Lighting structures	1	Lot		
3.2.13	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 3.2	

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.3	Bus Bar and Overhead Connections				
3.3.1	5" AL Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
3.3.2	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		
3.3.3	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		
3.3.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.3					
3.4	LV Control and Power Cable				
3.4.1	LV Control Cables	1	Lot		
3.4.2	LV Power Cables	1	Lot		
3.4.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		
3.4.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		
3.4.5	33kV Cable Pothead	1	Lot		
3.4.6	Power Cable for Filter Plant (Transformer) 3.5CX240 sq.mm. (Armoured, PVC Insulated) with suitable termination arrangement all complete	1	Lot		
3.4.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
3.4.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.4					
3.5	AC AND DC STATION SUPPLY				
3.5.1	400 V AC Main Switch Board				
3.5.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
3.5.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
3.5.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
3.5.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
3.5.2	400 V AC Main Lighting Board				
3.5.2.1	100kVA Lighting Transformer	2	Nos		
3.5.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
3.5.3	400 V AC Emergency Lighting Distribution Board				
3.5.3.1	100kVA Lighting Transformer	1	Nos		
3.5.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A Breaker	1	Nos		
3.5.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers	1	Nos		

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		1	2	3	(1) x (3)
3.5.4	400 V AC Distribution Board				
3.5.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
3.5.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
3.5.4.3	400/1A Current Transformer, Class 5P20	1	Nos		
3.5.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers	1	Nos		
3.5.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		
3.5.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
3.5.5	400 V AC AMF Panel				
3.5.5.1	400/1A Current Transformer, Class 1	3	Nos		
3.5.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
3.5.6	DC Chargers and Batteries				
3.5.6.1	220V Battery Charger (Float/Boost)	6	Nos		
3.5.6.2	48V Battery charger (Float/Boast)	6	Nos		
3.5.6.3	250A Throw over Switch, Interlock	12	Nos		
3.5.6.4	Battery, 220Vdc, 108 Minimum Cells	4	Nos		
3.5.6.5	Battery, 48Vdc, 24 Minimum Cells	4	Nos		
3.5.7	DC Distribution Boards				
3.5.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	6	Nos		
3.5.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	4	Nos		
3.5.7.3	DC Fuse Box, 220Vdc	1	Lot		
3.5.7.4	DC Fuse Box, 48Vdc	1	Lot		
3.5.8	Other Equipment				
3.5.8.1	Diesel Generator Set, 250kVA (Including Fuel Tank) and all accessories	1	Nos		
3.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.5					
3.6	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
3.6.1	Line/Feeder Bay-400 kV				
3.6.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	10	Nos		
3.6.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
3.6.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
3.6.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
3.6.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	10	Nos		
3.6.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set (1 set = 3 single phase)	10	Nos		
3.6.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	10	Nos		
3.6.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	10	Nos		
3.6.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	10	Nos		
3.6.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	10	Nos		
3.6.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		

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		1	2	3	(1) x (3)
3.6.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.1.14	Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for whole Line/Feeder Bay (Three Phase Set)	10	Bays		
3.6.2	Transformer Bay-400 kV				
3.6.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
3.6.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set (1 set = 3 single phase)	8	Nos		
3.6.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.6.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	8	Nos		
3.6.2.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	3	Nos		
3.6.2.6	Voltage Transformers, 400kV, dual secondary, earthing link, single-phase, three-phase set (1 set = 3 single phase)	3	Nos		
3.6.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	6	Nos		
3.6.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	6	Nos		
3.6.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
3.6.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
3.6.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.2.14	Isolating & Earthing Switches, 400kV, 4000A, 50kA Single phase, and Auxiliary Gas Insulated Bus (GIB) for Spare Transformer Operation, GIS to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete. 33kV isolators, 33kV cables , jumpers as required all complete	3	Set		
3.6.2.15	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for whole Transformer Bay Lot	3	Bays		
3.6.3	Diameter Middle Breaker Bay-400 kV				
3.6.3.1	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	4	Nos		
3.6.3.2	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	2	Nos		
3.6.3.3	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set ((1 set = 3 single phase)	12	Nos		
3.6.3.4	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.6.3.5	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	12	Nos		
3.6.3.6	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
3.6.3.7	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
3.6.3.8	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.3.9	All metallic structures and supports required for GIS complete with accessories	1	Lot		

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		1	2	3	(1) x (3)
3.6.3.10	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.4	Gas Insulated BUSBAR				
3.6.4.1	400kV , Double Bus Bar of 3 single phase (isolated), SF6 gas insulated , metal enclosed 4000A bus bars each enclosed in three individual bus enclosures per diameter	7	Diameter		
3.6.4.2	Voltage Transformers, 400kV, dual secondary, single-phase, three-phase set ((1 set = 3 single phase)	2	Nos		
3.6.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	2	Nos		
3.6.4.4	Main Bus Bar Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	2	Nos		
3.6.4.5	Bus Bar Isolating Disconnect Switches, 400kV, 4000A, 50kA, single phase, three-phase set ((1 set = 3 single phase)	2	Nos		
3.6.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.6					
3.7	220kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
3.7.1	Line/Feeder Bay-220 kV				
3.7.1.1	SF6 Circuit Breaker, 220kV, 4000A, 50kA, Three Pole	8	Nos		
3.7.1.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set ((1 set = 3 single phase)	16	Nos		
3.7.1.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
3.7.1.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
3.7.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.7.1.6	Voltage Transformers, 220kV, dual secondary, with earthing link, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.7.1.7	Line/Feeder Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.7.1.8	Line/Feeder Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.7.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	8	Nos		
3.7.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	8	Nos		
3.7.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.7.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.7.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.7.1.14	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for the whole	8	Bays		
3.7.2	Transformer Bay-220 kV				
3.7.2.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole.	6	Nos		
3.7.2.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.7.2.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.7.2.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.7.2.5	Transformer High Speed Earthing Switches, with removable earthing link 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	5	Nos		
3.7.2.6	Voltage Transformers, 220kV, dual secondary, with earthing link, single-phase, three-phase set (1 set = 3 single phase)	5	Nos		

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		1	2	3	(1) x (3)
3.7.2.7	Transformer Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.7.2.8	Transformer Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
3.7.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
3.7.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
3.7.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.7.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.7.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.7.2.14	Isolating & Earthing Switches, 220kV, 4000A, 50kA, Single phase, and Gas Insulated Bus (GIB) for Spare Transformer, with auxiliary Bus, GIS to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete.	3	Set		
3.7.2.15	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for the whole Transformer Bay	6	Bays		
3.7.3	Diameter Middle Breaker Bay -220 kV				
3.7.3.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole.	6	Nos		
3.7.3.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.7.3.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.7.3.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
3.7.3.5	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
3.7.3.6	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
3.7.3.7	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.7.3.8	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.7.3.9	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.7.4	Gas Insulated Bus bars				
3.7.4.1	220kV, Double 3 single phase (isolated), SF6 gas insulated, metal enclosed 4000A bus bars each enclosed in three individual bus enclosures per diameter	7	Diameter		
3.7.4.2	Voltage Transformers, 220kV, dual secondary, single-phase, three-phase set (1 set = 3 single phase)	2	Nos		
3.7.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 220kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	2	Nos		
3.7.4.4	Bus Bar Isolating Disconnect Switches, 220kV, 4000A, 50kA, single phase, three-phase set (1 set = 3 single phase)	2	Nos		
3.7.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 3.7	
3.8	Complete with control & protection up to GIB sealing end for all Feeder and				
3.8.1	Complete set of Control and Protection panels for 400 kV station as specified in				
3.8.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	12	Nos		
3.8.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)	12	Nos		
3.8.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no, Auto Trans Bay 2=1no)	4	Nos		

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		1	2	3	(1) x (3)
3.8.1.4	400kV (Double Bus Bar Protection)	2	Set		
3.8.1.5	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.8.2	Complete set of Control and Protection panels for 220 kV station as specified in				
3.8.2.1	Circuit Breaker Relay Panel	6	Nos		
3.8.2.2	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	4	Nos		
3.8.2.3	220kV (Double Bus Bar Protection)	2	Set		
3.8.2.4	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.8.3	Complete set of Control and Protection panels for 33 kV station as specified in				
3.8.3.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
3.8.3.2	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	2	Nos		
3.8.3.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.8.4	Substation Automation & Metering System				
3.8.4.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
3.8.4.2	Substation Automation System (SAS) for 400 kV System	7	Set		
3.8.4.3	Substation Automation System (SAS) for 220kV System	7	Set		
3.8.4.4	Substation Automation System (SAS) for 33kV System	2	Set		
3.8.4.5	Substation Automation System (SAS) for Auxiliary System	1	Set		
3.8.4.6	Integration of all 400/220kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
3.8.4.7	Telecommunication system for Ratmate	1	Lot		
3.8.4.8	Fibre Optic SDH System	1	Lot		
3.8.4.9	Phone System	1	Lot		
3.8.4.10	400 kV Metering	1	Lot		
3.8.4.11	220kV Metering	1	Lot		
3.8.4.12	Miscellaneous Relay and Control Equipment, not included above	1	Lot		

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		1	2	3	(1) x (3)
Sub Total 3.8					
3.9	Grounding System				
3.9.1	Stranded Bare Copper 240 Sq. mm*** Grid (Including Fusion and Mechanical Connectors)	1	Lot		
3.9.2	Grounding Rods	1	Lot		
3.9.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
3.9.4	Embedded Grounding System - 220kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
3.9.5	Embedded Grounding System - Control Room	1	Lot		
3.9.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.9					
3.10	Lightning Protection System				
3.10.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
3.10.2	Lightening Mast as required for total protection of equipment	1	Lot		
3.10.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.10					
3.11	Firefighting System				
3.11.1	Fire protection/detection for 7 (Seven) auto transformers	1	Lot		
3.11.2	Fire protection/detection for 400kV GIS Building	1	Lot		
3.11.3	Fire protection/detection for 220kV GIS Building	1	Lot		
3.11.4	Fire protection/detection for Control House	1	Lot		
3.11.5	Fire protection/detection system for pump house building	1	Lot		
3.11.6	Fire protection/detection system for generator diesel tank	1	Lot		
3.11.7	Portable fire extinguishers	1	Lot		
3.11.8	Clean-agent fire extinguishers	1	Lot		
3.11.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.11					
3.12	HVAC And Ventilation Systems				
3.12.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
3.12.2	220kV GIS Building HVAC and Ventilation Systems	1	Lot		
3.12.3	Control House HVAC and Ventilation Systems	1	Lot		
Sub Total 3.12					
3.13	Accessories and Ancillary Material				
3.13.1	Junction and marshalling boxes, outdoor	1	Lot		
3.13.2	Junction and marshalling boxes, indoor	1	Lot		
3.13.3	Outdoor lighting, including lighting fixtures	1	Lot		
3.13.4	Indoor lighting, including lighting fixtures	1	Lot		
3.13.5	Control Cabinet for outdoor lighting	1	Lot		
3.13.6	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
3.13.7	Electric Overhead Travelling Crane for installation and removal of GIS Equipment (For 400 and 220 kV each)	2	Lot		
3.13.8	Visual Monitoring System	1	Lot		
3.13.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.13					

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		1	2	3	(1) x (3)
3.14	Mandatory Maintenance, Repair tools and Testing Instruments				
3.14.1	GIS Equipment				
3.14.1.1	400kV GIS SF6 leakage detector, analyzer and processing unit all complete	1	Lot		
3.14.1.2	220kV GIS SF6 leakage detector, analyzer and processing unit all complete	1	Lot		
3.14.1.3	400kV GIS Wrenches and tools	1	Lot		
3.14.1.4	220kV GIS Wrenches and tools	1	Lot		
3.14.1.5	400kV GIS Pressure gauge	1	Nos		
3.14.1.6	220kV GIS Pressure gauge	1	Nos		
3.14.1.7	400kV GIS Gas sampling and moisture meter	1	Nos		
3.14.1.8	220kV GIS Gas sampling and moisture meter	1	Nos		
3.14.1.9	400kV GIS Micro-Ohmmeter	1	Nos		
3.14.1.10	220kV GIS Micro-Ohmmeter	1	Nos		
3.14.1.11	400kV GIS Circuit-breaker, timing tester	1	Nos		
3.14.1.12	220kV GIS Circuit-breaker, timing tester	1	Nos		
3.14.1.13	400kV GIS Laptop computer with specialized software for GIS setting and monitoring	1	Nos		
3.14.1.14	220kV GIS Laptop computer with specialized software for GIS setting and monitoring	1	Nos		
3.14.1.15	Complete set of SF6 gas service cart mounted on a trailer for mobile application. SF6 gas refilling cart equipped with 1 SF6 gas cylinder and the necessary instruments and adapters for easy and quick gas refilling in case of losses	1	Lot		
3.14.1.16	HV Test Bushing for GIS	1	Lot		
3.14.1.17	Online Partial Discharge Monitoring System	1	Nos		
3.14.2	Auto Transformer & Station Service Transformer				
3.14.2.1	Oil-treatment unit 6000lph along with suitable size and quantity of connection arrangement (MCCB (240-300 Amp), terminal lugs etc.) all complete (autotransformer)	1	Nos		
3.14.2.2	Oil dielectric tester	1	Nos		
3.14.2.3	Dielectric tester based on tan δ and dielectric losses , 10 kV	1	Nos		
3.14.2.4	Megger, electronic, 5 kV	1	Nos		
3.14.2.5	Wrenches and tools	1	Lot		
3.14.3	Complete set of Control and Protection for Sub-Station				
3.14.3.1	Relay Test kit	1	Lot		
3.14.3.2	Test Equipment & tools for SAS SYSTEM for measuring, configuration & diagnostics.	1	Lot		
Sub Total 3.14					
3.15	Mandatory Spare Parts				
3.15.1	HV Equipment				
3.15.1.1	Unit of 400kV surge arrester, complete with grading ring, terminals and surge counter	2	Nos		
3.15.1.2	Capacitive voltage transformer, 400kV	1	Nos		
3.15.1.3	Current transformer, 400kV	1	Nos		
3.15.1.4	Current transformer, 72.5kV	1	Nos		

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		1	2	3	(1) x (3)
3.15.2	Auto Transformer				
3.15.2.1	Complete set of gaskets with grease, for cover, manholes, hand holes, and pipping fittings.	2	Lot		
3.15.2.2	Lot of LV control and protective components, minimum one unit of each type of components used	2	Lot		
3.15.2.3	Pressure relief device, complete with accessories	2	Nos		
3.15.2.4	Bushings, one complete unit of each type used, with accessories	2	Lot		
3.15.2.5	Current transformer, one unit of each type	2	Lot		
3.15.2.6	Oil-circulating pump with motor, complete with accessories	2	Nos		
3.15.2.7	Cooling fan, complete with motor	2	Nos		
3.15.2.8	Buchholz relay, complete (2 each for main tank and OLTC tank)	4	Nos		
3.15.2.9	One instrument of each type used (temperature, oil level, pressure vent, etc.)	2	Lot		
3.15.2.10	One valve of each type used	2	Lot		
3.15.2.11	Insulating oil, 5% of the volume used	1	Lot		
3.15.2.12	Silica gel, quantity for one load	1	Lot		
3.15.2.13	Tap changer diverter switch, spare contacts and transition resistance	2	Lot		
3.15.2.14	Tap changer selector switch spare contacts	2	Lot		
3.15.2.15	Rolls of Kraft insulating paper	2	Lot		
3.15.2.16	LA for HV,IV and LV side each	2	Lot		
3.15.2.17	Additional spare parts as per Chapter 3: Auto Transformer Specification of Part 2: Employer's Requirements, Section V – B1 (Technical Specifications).	1	Lot		
3.15.3	630 kVA Transformer				
3.15.3.1	All Bushing with metal parts (each voltage rating) for 630 kVA Transformer	1	Lot		
3.15.3.2	Oil Temperature Indicator with sensing device	1	Lot		
3.15.3.3	Tap Changer Contacts	1	Lot		
3.15.3.4	Buchholz Relay	1	Nos		
3.15.3.5	Explosion vent diaphragm	1	Nos		
3.15.3.6	Set of valve (each type)	1	Lot		
3.15.3.7	3-Phase 11 kV Horn Gap Fuse	1	Lot		
3.15.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.15					
3.16	Spare Parts for AC and DC Station Supply				
3.16.1	Spare for LV Switchgear				
3.16.1.1	LV circuit breaker, complete, with CT's and protection devices	1	Lot		
3.16.1.2	Outgoing thermomagnetic breakers - one unit of each type used	1	Lot		
3.16.1.3	Metering - one instrument of each type used	1	Lot		
3.16.1.4	Protection (other than included in LV breaker) One unit of each type used	1	Lot		
3.16.1.5	Automatic Transfer Switch One complete controller including sensors	1	Nos		
3.16.1.6	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc	1	Lot		

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		1	2	3	(1) x (3)
3.16.2	Spare for DC Distribution Panels				
3.16.2.1	Thermomagnetic breakers one unit of each type used	1	Lot		
3.16.2.2	Metering - one metering instrument of each type used	1	Lot		
3.16.2.3	Protection (other than included in LV breaker) One unit of each type used	1	Lot		
3.16.2.4	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc	1	Lot		
3.16.3	Spare for Diesel Generator Set				
3.16.3.1	Replaceable elements for air filter	1	Nos		
3.16.3.2	Replaceable elements for oil filter	1	Nos		
3.16.3.3	Replaceable elements for fuel filter	1	Nos		
3.16.3.4	Complete set of injectors	1	Nos		
3.16.3.5	Fuel injector pump	1	Nos		
3.16.3.6	Oil pump	1	Nos		
3.16.3.7	Intake valves	1	Nos		
3.16.3.8	Seats for intake valves	1	Nos		
3.16.3.9	Exhaust valves	1	Nos		
3.16.3.10	Set for exhaust valves	1	Nos		
3.16.3.11	Disconnect switch, with grounding blades, 220 kV, 3 Ø	1	Nos		
3.16.3.12	Set of pistons	1	Nos		
3.16.3.13	Set of complete bearings of the engine	1	Nos		
3.16.3.14	Set of all gaskets needed for the engine	1	Nos		
3.16.3.15	Set of thermostats	1	Nos		
3.16.3.16	Set of bearings for the alternator	1	Nos		
3.16.3.17	Set of control cards, at least one unit of each type used	1	Lot		
3.16.3.18	Diodes and thyristors of each type used	3	Nos		
3.16.3.19	Lamp, one unit of each type used	10	Nos		
3.16.3.20	Auxiliary relay, one unit of each type used	1	Lot		
3.16.3.21	Multifunction metering instrument	1	Nos		
3.16.3.22	Voltage and speed regulator component and actuator	1	Nos		
3.16.3.23	Controller components	1	Nos		
3.16.3.24	Instrument, detectors	1	Nos		
3.16.4	Spare for Batteries				
3.16.4.1	One unit of battery used in 220 V DC system	1	Nos		
3.16.4.2	Loose parts for 220 V DC - connection elements, cables, links, etc	1	Lot		
3.16.4.3	One unit of battery used in 48 Vdc system	1	Nos		
3.16.4.4	Loose parts for 48 V DC - connection elements, cables, links, etc	1	Lot		
3.16.5	Spare for Battery Chargers				
3.16.5.1	Complete bridge of thyristors assembled on a cooling base	1	Nos		
3.16.5.2	Controller, complete including each type of card used	1	Nos		
3.16.5.3	Loose elements - auxiliary relays, breakers, metering instruments, control switches, fuses, etc.	1	Lot		
3.16.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 3.16	

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		1	2	3	(1) x (3)
3.17	Mandatory spare parts - Miscellaneous material				
3.17.1	Junction and marshalling boxed, outdoor, one of each type used	1	Lot		
3.17.2	Junction and marshalling boxed, indoor, one of each type used	1	Lot		
3.17.3	Outdoor lighting fixture, one unit of each type used	1	Lot		
3.17.4	Post-type insulator, one unit of each type used	1	Lot		
3.17.5	Suspension insulator, 5% of the total used	1	Lot		
3.17.6	Bus bar (rigid and strain) hardware, including, connectors, terminals, separator, corona rings, 5% of each type used, minimum one unit	1	Lot		
3.17.7	Grounding conductors, 5% of the installed conductors (stranded copper conductor, rectangular-shape copper bar and grounding rod)	1	Lot		
3.17.8	Fission connection material, including molds, welding powder and installation tools, quantity required to make 5% of the total executed connections	1	Lot		
3.17.9	Mechanical connectors for grounding, 5% of the total executed connections	1	Lot		
3.17.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 3.17	
3.18	Mandatory spare parts for 400kV and 220kV GIS				
3.18.1	Spare Gas				
3.18.1.1	SF6 bottles required to fill the two largest volume compartments for 400kV and 220kV	2	Lot		
3.18.2	Circuit Breakers, 4000 A, 50kA (For 400kV)				
3.18.2.1	Circuit breaker, complete pole assembly	1	Lot		
3.18.2.2	Complete sets of main contacts	1	Lot		
3.18.2.3	Complete sets of arcing contacts	2	Lot		
3.18.2.4	Operating mechanism, complete	1	Lot		
3.18.2.5	Closing coils	10	Nos		
3.18.2.6	Tripping coils	10	Nos		
3.18.3	Circuit Breakers, 4000 A, 50kA (For 220kV)				
3.18.3.1	Circuit breaker, complete pole assembly	1	Lot		
3.18.3.2	Complete sets of main contacts	1	Lot		
3.18.3.3	Complete sets of arcing contacts	2	Lot		
3.18.3.4	Operating mechanism, complete	1	Lot		
3.18.3.5	Closing coils	10	Nos		
3.18.3.6	Tripping coils	10	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.18.4	Disconnect-Switches, 4000 A (For 400kV)				
3.18.4.1	Disconnect-Switch, complete pole	1	Nos		
3.18.4.2	Complete set of contacts	2	Nos		
3.18.4.3	Operating mechanism, complete	1	Nos		
3.18.4.4	Operating mechanism motor	2	Nos		
3.18.5	Disconnect-Switches, 4000 A (For 220kV)				
3.18.5.1	Disconnect-Switch, complete pole	1	Nos		
3.18.5.2	Complete set of contacts	2	Nos		
3.18.5.3	Operating mechanism, complete	1	Nos		
3.18.5.4	Operating mechanism motor	2	Nos		
3.18.6	Maintenance Earthing Switches (For 400kV)				
3.18.6.1	Earthing-Switch, complete pole	1	Lot		
3.18.6.2	Complete set of contacts	2	Nos		
3.18.6.3	Operating mechanism, complete	1	Lot		
3.18.6.4	Operating mechanism motor	2	Nos		
3.18.7	Maintenance Earthing Switches (For 220kV)				
3.18.7.1	Earthing-Switch, complete pole	1	Lot		
3.18.7.2	Complete set of contacts	2	Nos		
3.18.7.3	Operating mechanism, complete	1	Lot		
3.18.7.4	Operating mechanism motor	2	Nos		
3.18.8	High-speed earthing Switches (For 400kV)				
3.18.8.1	High-speed earthing switch, complete pole	1	Lot		
3.18.8.2	Complete set of contacts	2	Nos		
3.18.8.3	Operating mechanism, complete	1	Lot		
3.18.8.4	Operating mechanism motor	2	Nos		
3.18.9	High-speed earthing Switches (For 220kV)				
3.18.9.1	High-speed earthing switch, complete pole	1	Lot		
3.18.9.2	Complete set of contacts	2	Nos		
3.18.9.3	Operating mechanism, complete	1	Lot		
3.18.9.4	Operating mechanism motor	2	Nos		
3.18.10	Other Equipment				
3.18.10.1	Voltage transformer, 400 kV, complete with disconnecting and earthing switch	3	Nos		
3.18.10.2	Voltage transformer, 220 kV, complete with disconnecting and earthing switch	3	Nos		
3.18.10.3	Current transformer, metering core, loose part for 400kV	6	Nos		
3.18.10.4	Current transformer, metering core, loose part for 220kV	6	Nos		
3.18.10.5	Current transformer, protection core, loose part for 400kV	6	Nos		
3.18.10.6	Current transformer, protection core, loose part for 220kV	6	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.18.11	400kV GIS and 220kV GIS Bay, Local Control Cabinet				
3.18.11.1	One Bay Local Control Cabinet complete, wired, with all specified devices	2	Lot		
3.18.12	Bus bar Elements (For 400kV)				
3.18.12.1	Bus conductor elements	2	Lot		
3.18.12.2	Bus connection elements	2	Lot		
3.18.12.3	GIS insulators, one of each type used	2	Lot		
3.18.12.4	Pressure relief elements	2	Lot		
3.18.13	Bus bar Elements (For 220kV)				
3.18.13.1	Bus conductor elements	2	Lot		
3.18.13.2	Bus connection elements	2	Lot		
3.18.13.3	GIS insulators, one of each type used	2	Lot		
3.18.13.4	Pressure relief elements	2	Lot		
3.18.14	SF6-to-Air Bushing Modules				
3.18.14.1	SF6-to-air bushing module, 400 kV, single phase	1	Lot		
3.18.14.2	SF6-to-air bushing module, 220 kV, single phase	1	Lot		
3.18.15	Loose Spare Parts				
3.18.15.1	5% of auxiliary relays, control devices, fuses, terminal blocks, etc. minimum one unit of each type used	2	Lot		
3.18.16	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.18					
3.19	Spare of LV control and power cables				
3.19.1	LV control cable, 5% of the installed cables	1	Lot		
3.19.2	LV power cable, 5% of the installed cables	1	Lot		
3.19.3	Cable installation accessories - 5% of the installed material	1	Lot		
3.19.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.19					
3.20	Spare parts of Mechanical Equipment				
3.20.1	Fire protection				
3.20.1.1	Fire protection/detection for auto transformer - one unit of each type used	1	Lot		
3.20.1.2	Clean-agent fire extinguisher	1	Lot		
3.20.1.3	Control building general fire protection/detection system, one unit of each component used	1	Lot		
3.20.1.4	GIS building general fire protection/detection system, one unit of each component used	1	Lot		
3.20.2	Control building HVAC system				
3.20.2.1	Throwaway air filters per air conditioning unit	1	Lot		
3.20.2.2	Pulley belts per air conditioning unit motor	1	Lot		
3.20.2.3	Thermostat per air conditioning unit	1	Lot		
3.20.3	GIS building ventilation system				
3.20.3.1	Throwaway air filters per ventilation system	1	Lot		
3.20.3.2	Pulley belts per ventilation unit motor	1	Lot		
3.20.3.3	Thermostat per ventilation unit	1	Lot		
3.20.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.20					

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
3.21	Works at New-Hetauda				
3.21.1	Approach cable and hardware for termination of OPGW including joint box of Ratmate – Hetauda D/C Lines at New Hetauda Substation End including necessary AC,DC and Interfacing cable for tele protection application. Addition to the above Telecommunication works should include connection, extension and configuration of the local and network remote fiber optic equipment and all works required for the connection, extension and configuration of the phone system as well as for tele protection	1	Lot		
Sub Total 3.21					
3.22	Works at Lapsiphedhi				
3.22.1	Supply and installation of necessary approach cable and hardware for termination of OPGW of Ratmate – Lapsiphedhi D/C Lines at Lapsiphedhi Substation End, it's interfacing with existing DPC for tele protection application and necessary SDH, MUX/DMUX telecommunication terminal equipment required for the communication of the 400 kV Lines and its integrations with SAS at both end substations and SCADA system of the LDC. Addition to above Telecommunication works should include connection, extension and configuration of the local and network remote fiber optic equipment and all works required for the connection, configuration and extension of the phone system as well as for tele protection	1	Lot		
Sub Total 3.22					
Total (Carried forward to Grand SC-5)					
Name of Bidder:					
Signature of Bidder:					
Note:					
***:This value is indicative, the Contractor will validate as per item 1.1.6 of Design Works (Electrical)					

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Breakdown of Rates and Prices Schedule No. 4. Installation and Other Services including all related Civil

Item No.	Description	Total
4.1	Breakdown of General Installation and Construction Items (from Schedule No. 4.1)	
4.2	Breakdown of Earthworks (from Schedule No.4.2)	
4.3	Breakdown of Civil Works (from Schedule No.4.3)	
4.4	Other Installation Services (from Schedule No.4.5)	
4.5	Total Excluding Summary of Breakdown of Day works (from Schedule 4.4) (Carried forward to Grand SC-5)	
4.6	Summary of Breakdown of Day works (from Schedule 4.4) (Carried forward to Grand SC-5)	
4.7	Total Including Breakdown of Day works.	
	Name of the Bidder:	
	Signature of Bidder:	

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Schedule No. 4.1: Breakdown of General Installation and Construction Items

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.1	Electromechanical Works General				
4.1.1.1	Indoor and outdoor storage facilities for storing equipment and material in substation	1	Lot		
4.1.1.2	Site Office, Accommodation and vehicular arrangement as Specified in PSR	1	Lot		
4.1.1.3	Operation and Maintenance Manuals and Procedures	1	Lot		
4.1.1.4	"As-Built" Drawings for All Works including civil, building, mechanical etc.	1	Lot		
4.1.1.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.1.1					
4.1.2	AIS HV and MV Equipment Installation				
4.1.2.1	167 MVA, (400/√3/220/√3/33) kV, Single Phase Auto-Transformer with OLTC, RTCC Facility, Surge protection arrangement (AIS) for HV, IV and LV side and with Bushing CT complete with all accessories as specified	7	Nos		
4.1.2.2	Capacitor Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	18	Nos		
4.1.2.3	Current Transformer (CT), 400kV, Single Phase, Live Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	18	Nos		
4.1.2.4	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
4.1.2.5	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	18	Nos		
4.1.2.6	Substation Service Transformer, 630 kVA, 33/0.400kV	2	Nos		
4.1.2.7	30kV,10kA Lightning arrester for 33kV line bays with support structure, earthing arrangement all complete	6	Nos		
4.1.2.8	30kV,10kA Lightning arrester for 33/0.4kV station service transformers with support structure, earthing arrangement all complete	6	Nos		
4.1.2.9	72.5kV Double Break Isolator, Single Phase	1	Lot		
4.1.2.10	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
4.1.2.11	72.5kV Current Transformer	6	Nos.		
4.1.2.12	400kV Bus Support Post Insulator	1	Lot		
4.1.2.13	220kV Bus Support Post Insulator	1	Lot		
4.1.2.14	72.5kV Bus Support Post Insulator	1	Lot		
4.1.2.15	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
4.1.2.16	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.1.2					
4.1.3	Hot-Dip Galvanized Steel Installation				
4.1.3.1	Gantry Column for 400 kV Incoming Line	7	Ea.		
4.1.3.2	Gantry Girder for 400 kV Incoming Line	6	Ea.		
4.1.3.3	Support Structure for 400 kV Current Transformer	18	Ea.		
4.1.3.4	Support Structure for 400 kV Capacitive Voltage Transformer	18	Ea.		
4.1.3.5	Support Structure for 400 kV Surge Arrester	18	Ea.		
4.1.3.6	Support Structure for 400 kV Bus Support	1	Lot		
4.1.3.7	Support Structure for 220 kV Bus Support	1	Lot		
4.1.3.8	Support Structure for 72.5 kV Current Transformer	6	Ea.		
4.1.3.9	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
4.1.3.10	Support Structure for 72.5 kV Single Switch Stand	1	Lot		
4.1.3.11	Structures for Lightning Mast and other Lighting	1	Lot		
4.1.3.12	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.3					
4.1.4	Bus Bar and Overhead Connections Installation				
4.1.4.1	5" AL Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
4.1.4.2	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		

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Schedule No. 4.1: Breakdown of General Installation and Construction Items

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.4.3	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		
4.1.4.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.4					
4.1.5	LV Control and Power Cable Installation				
4.1.5.1	LV Control Cables	1	Lot		
4.1.5.2	LV Power Cables	1	Lot		
4.1.5.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		
4.1.5.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		
4.1.5.5	33kV Cable Pothead	1	Lot		
4.1.5.6	Power Cable for Filter Plant (Transformer) 3.5CX240 sqmm (Armoured, PVC Insulated) with suitable termination arrangement all complete	1	Lot		
4.1.5.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
4.1.5.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.5					
4.1.6	AC and DC Station Supply Installation				
4.1.6.1	400 V AC Main Switch Board				
4.1.6.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
4.1.6.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
4.1.6.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
4.1.6.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
4.1.6.2	400 V AC Main Lighting Board				
4.1.6.2.1	100kVA Lighting Transformer	2	Nos		
4.1.6.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
4.1.6.3	400 V AC Emergency Lighting Distribution Board				
4.1.6.3.1	100kVA Lighting Transformer	1	Nos		
4.1.6.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker	1	Nos		
4.1.6.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers	1	Nos		
4.1.6.4	400 V AC Distribution Board				
4.1.6.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
4.1.6.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
4.1.6.4.3	400/1A Current Transformer, Class 5P20	1	Nos		
4.1.6.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers	1	Nos		
4.1.6.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		
4.1.6.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
4.1.6.5	400 V AC AMF Panel				
4.1.6.5.1	400/1A Current Transformer, Class 1	3	Nos		

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.6.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
4.1.6.6	DC Chargers and Batteries				
4.1.6.6.1	220V Battery Charger (Float/Boost)	6	Nos		
4.1.6.6.2	48V Battery charger (Float/Boast)	6	Nos		
4.1.6.6.3	250A Throw over Switch, Interlock	12	Nos		
4.1.6.6.4	Battery, 220Vdc, 108 Minimum Cells	4	Nos		
4.1.6.6.5	Battery, 48Vdc, 24 Minimum Cells	4	Nos		
4.1.6.7	DC Distribution Boards				
4.1.6.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	6	Nos		
4.1.6.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	4	Nos		
4.1.6.7.3	DC Fuse Box, 220Vdc	1	Lot		
4.1.6.7.4	DC Fuse Box, 48Vdc	1	Lot		
4.1.6.8	Other Equipment				
4.1.6.8.1	Diesel Generator Set, 250kVA (Including Fuel Tank) and all accessories	1	Nos		
4.1.6.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.6					
4.1.7	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement) Installation				
4.1.7.1	Line/Feeder Bay				
4.1.7.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	10	Nos		
4.1.7.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
4.1.7.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
4.1.7.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	20	Nos		
4.1.7.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	10	Nos		
4.1.7.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set (1 set = 3 single phase)	10	Nos		
4.1.7.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	10	Nos		
4.1.7.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA,	10	Nos		
4.1.7.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	10	Nos		
4.1.7.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	10	Nos		
4.1.7.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.1.14	Gas Insulated bus (GIB) with required GIS Termination along with supports for GIB run for whole Line/Feeder Bay (Three phase set)	10	Bays		
4.1.7.2	Transformer Bay				
4.1.7.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
4.1.7.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set (1 set = 3 single phase)	8	Nos		
4.1.7.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	8	Nos		
4.1.7.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	8	Nos		

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.7.2.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	3	Nos		
4.1.7.2.6	Voltage Transformers, 400kV, dual secondary, with disconnect switch and maintenance earthing switch, single-phase, three-phase set (1 set = 3 single phase)	3	Nos		
4.1.7.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	6	Nos		
4.1.7.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	6	Nos		
4.1.7.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
4.1.7.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
4.1.7.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.2.14	Isolating & Earthing Switches, 400kV, 4000A, 50kA Single phase, and Auxiliary Gas Insulated Bus (GIB) for Spare Transformer Operation, GIS to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete. 33kV isolators, 33kV cables, jumpers as required all complete	3	Nos		
4.1.7.2.15	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for whole Transformer Bay Lot	3	Bays		
4.1.7.3	Diameter Middle Breaker Bay				
4.1.7.3.1	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	4	Nos		
4.1.7.3.2	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	2	Nos		
4.1.7.3.3	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set (1 set = 3 single phase)	12	Nos		
4.1.7.3.4	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	12	Nos		
4.1.7.3.5	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	12	Nos		
4.1.7.3.6	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
4.1.7.3.7	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
4.1.7.3.8	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.3.9	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.3.10	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.4	Gas Insulated BUSBAR				
4.1.7.4.1	400kV, Double Bus Bar of 3 single phase (isolated), SF6 gas insulated, metal enclosed 4000A bus bars each enclosed in three individual bus enclosures per diameter	7	Diameter		
4.1.7.4.2	Voltage Transformers, 400kV, dual secondary, single-phase, three-phase set (1 set = 3 single phase)	2	Nos		
4.1.7.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three phase set (1 set = 3 single phase)	2	Nos		

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.7.4.4	Main Bus Bar Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set (1 set = 3 single phase)	2	Nos		
4.1.7.4.5	Bus Bar Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	2	Nos		
4.1.7.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.7					
4.1.8	220kV Gas Insulated Switchgear (1-1/2 breaker arrangement) Installation				
4.1.8.1	Line/Feeder Bay				
4.1.8.1.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole	8	Nos		
4.1.8.1.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
4.1.8.1.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
4.1.8.1.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	16	Nos		
4.1.8.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
4.1.8.1.6	Voltage Transformers, 220kV, dual secondary, with earthing link, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
4.1.8.1.7	Line/Feeder Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
4.1.8.1.8	Line/Feeder Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
4.1.8.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	8	Nos		
4.1.8.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	8	Nos		
4.1.8.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.8.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.8.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.8.1.14	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for the whole Line/Feeder	8	Bays		
4.1.8.2	Transformer Bay				
4.1.8.2.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole	6	Nos		
4.1.8.2.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
4.1.8.2.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
4.1.8.2.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
4.1.8.2.5	Transformer High Speed Earthing Switches, with removable earthing link 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	5	Nos		
4.1.8.2.6	Voltage Transformers, 220kV, dual secondary, with earthing link, single-phase, three-phase set (1 set = 3 single phase)	5	Nos		
4.1.8.2.7	Transformer Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
4.1.8.2.8	Transformer Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	8	Nos		
4.1.8.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
4.1.8.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.8.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.8.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.8.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.8.2.14	Isolating & Earthing Switches, 220kV, 4000A, 50kA, Single phase, and Gas Insulated Bus (GIB) for Spare Transformer, with auxiliary Bus, GIS to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete.	3	Set		
4.1.8.2.15	Three Single Phase Gas Insulated bus (GIB) and required GIS Termination along with supports for GIB run for the whole Transformer Bay	6	Nos		
4.1.8.3	Diameter Middle Breaker Bay				
4.1.8.3.1	SF6 Circuit Breakers, 220kV, 4000A, 50kA, three-pole	6	Nos		
4.1.8.3.2	Current Transformer Modules, three cores, 220kV, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
4.1.8.3.3	Circuit Breaker Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
4.1.8.3.4	Circuit Breaker Maintenance Earthing Switches, 220kV, 50kA, single-phase, three-phase set (1 set = 3 single phase)	12	Nos		
4.1.8.3.5	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	6	Nos		
4.1.8.3.6	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	6	Nos		
4.1.8.3.7	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.8.3.8	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.8.3.9	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.8.4	Gas Insulated Bus Bars				
4.1.8.4.1	220kV, Double 3 single phase (isolated), SF6 gas insulated, metal enclosed 4000A bus bars each enclosed in three individual bus enclosures per diameter	7	Diameter		
4.1.8.4.2	Voltage Transformers, 220kV, dual secondary, single-phase, three-phase set (1 set = 3 single phase)	2	Nos		
4.1.8.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 220kV, 50kA, Single-phase, Three phase set (1 set = 3 single phase)	2	Nos		
4.1.8.4.4	Bus Bar Isolating Disconnect Switches, 220kV, 4000A, 50kA, single-phase, three-phase set (1 set = 3 single phase)	2	Nos		
4.1.8.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.8					
4.1.9	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.				
4.1.9.1	Installation of Control and Protection panels for 400 kV station as specified in Scope and Employers				
4.1.9.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)(NHet=2nos,Lap=2nos,NDM=2nos,AutoTrans=2nos,TieCB=4nos)	12	Nos		
4.1.9.1.2	Line Protection Panel (N-Het=2no,NDM=2no,Lap=2no) (Note: line protection should include tele protection terminals)	12	Nos		
4.1.9.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	4	Nos		
4.1.9.1.4	400kV (Duplicate Bus Bar Protection)	2	Set		
4.1.9.1.5	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.9.2	Installation set of Control and Protection panels for 220 kV station as specified in Scope and Employers				
4.1.9.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the relay panel) (Auto Trans Bay 1=2nos,Auto Trans Bay 2=2nos,Tie CB=2nos)	6	Nos		

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.9.2.2	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	4	Nos		
4.1.9.2.3	220kV (Duplicate Bus Bar Protection)	2	Nos		
4.1.9.2.4	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.9.3	Installation of Control and Protection panels for 33 kV station as specified in Scope and Employers				
4.1.9.3.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
4.1.9.3.2	Transformer Protection Panel	2	Nos		
4.1.9.3.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.9.4	Installation of Substation Automation & Metering				
4.1.9.4.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
4.1.9.4.2	Substation Automation System (SAS) for 400 kV System per diameter	7	Set		
4.1.9.4.3	Substation Automation System (SAS) for 220kV System per diameter	7	Set		
4.1.9.4.4	Substation Automation System (SAS) for 33kV System per feeder	2	Set		
4.1.9.4.5	Substation Automation System (SAS) for Auxiliary System	1	Set		
4.1.9.4.6	Integration of all 400/220kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
4.1.9.4.7	Telecommunication system for Ratmate	1	Lot		
4.1.9.4.8	Fibre Optic SDH System	1	Lot		
4.1.9.4.9	Phone System	1	Lot		
4.1.9.4.10	400 kV Metering	1	Lot		
4.1.9.4.11	220 kV Metering	1	Lot		
4.1.9.4.12	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
Sub-Total 4.1.9					
4.1.10	Grounding System				
4.1.10.1	Stranded Bare Copper 240 Sq. mm***Grid (Including Fusion and Mechanical Connectors)	1	Lot		
4.1.10.2	Grounding Rods	1	Lot		
4.1.10.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
4.1.10.4	Embedded Grounding System - 220kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
4.1.10.5	Embedded Grounding System - Control room	1	Lot		
4.1.10.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub-Total 4.1.10					
4.1.11	Lightning Protection System				
4.1.11.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
4.1.11.2	Lightening Mast for complete protection	1	Lot		
4.1.11.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.1.11					
4.1.12	Firefighting System				
4.1.12.1	Fire protection/detection for 7 (Seven) auto transformers	1	Lot		
4.1.12.2	Fire protection/detection for 400kV GIS Building	1	Lot		
4.1.12.3	Fire protection/detection for 220kV GIS Building	1	Lot		
4.1.12.4	Fire protection/detection for Control House	1	Lot		
4.1.12.5	Fire protection/detection system for pump house building	1	Lot		
4.1.12.6	Fire protection/detection system for generator diesel tank	1	Lot		
4.1.12.7	Portable fire extinguishers	1	Lot		
4.1.12.8	Clean-agent fire extinguishers	1	Lot		
4.1.12.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.1.12					
4.1.13	HVAC And Ventilation Systems				

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
		1	2	3	(1)x(3)
4.1.13.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
4.1.13.2	220kV GIS Building HVAC and Ventilation Systems	1	Lot		
4.1.13.3	Control House HVAC and Ventilation Systems	1	Lot		
Sub Total 4.1.13					
4.1.14	Accessories and Ancillary Material				
4.1.14.1	Junction and marshalling boxes, outdoor	1	Lot		
4.1.14.2	Junction and marshalling boxes, indoor	1	Lot		
4.1.14.3	Outdoor lighting, including lighting fixtures	1	Lot		
4.1.14.4	Indoor lighting, including lighting fixtures	1	Lot		
4.1.14.5	Control Cabinet for outdoor lighting	1	Lot		
4.1.14.6	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
4.1.14.7	Electric Overhead Travelling Crane for installation and removal of GIS Equipment (For 400 and 220 kV each)	2	Lot		
4.1.14.8	Visual Monitoring System	1	Lot		
4.1.14.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.1.14					
4.1.15	Works at New-Hetauda				
4.1.15.1	Approach cable and hardware for termination of OPGW including joint box of Ratmate – Hetauda D/C Lines at New Hetauda Substation End including necessary AC,DC and Interfacing cable for tele protection application. Addition to the above Telecommunication works should include connection, extension and configuration of the local and network remote fiber optic equipment and all works required for the connection, extension and configuration of the phone system as well as for tele	1	Lot		
Sub Total 4.1.15					
4.1.16	Works at Lapsiphedi				
4.1.16.1	Supply and installation of necessary approach cable and hardware for termination of OPGW of Ratmate – Lapsiphedi D/C Lines at Lapsiphedi Substation End, it's interfacing with existing DPC for tele protection application and necessary SDH, MUX/DMUX telecommunication terminal equipment required for the communication of the 400 kV Lines and its integrations with SAS at both end substations and SCADA system of the LDC. Addition to above Telecommunication works should include connection, extension and configuration of the local and network remote fiber optic equipment and all works required for the connection, configuration and	1	Lot		
Sub-Total 4.1.16					
Total (Carried forward to SC-4)					
Name of the Bidder:					
Signature of Bidder:					

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Schedule No. 4.2: Breakdown of Earthworks					
Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
4.2.1	Site Clearing, Including Removal of Trees and Stumps	1	Lot		
4.2.2	Top Soil Stripping	1	Lot		
4.2.3	General Excavation	1	Lot		
4.2.4	Compacted Back Fill	1	Lot		
4.2.5	Uncompact Back Fill	1	Lot		
4.2.6	Surplus Disposal	1	Lot		
4.2.7	Surface Works, Including Compaction/Consolidation	1	Lot		
4.2.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Total (Carried to SC-4)					
Name of the Bidder:					
Signature of Bidder:					

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Schedule No. 4.3: Breakdown of Civil Works					
Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in
		1	2	3	(1)x(3)
4.3.1	Foundations				
4.3.1.1	Foundations of 400 kV Gantries	7	Nos		
4.3.1.2	Foundations of 400 kV Capacitor Voltage Transformers & Tank Type Current Transformers	36	Nos		
4.3.1.3	Foundation of 400 kV Surge Arrestor	18	Nos		
4.3.1.4	Foundations of 400 kV Post Type Insulator Bus Support	1	Lot		
4.3.1.5	Foundation, Oil Containment, and Sump Pit For 400/220kV 167 MVA Single Phase Autotransformer	7	Nos		
4.3.1.6	Autotransformer 22kg/m Railway System (22kg/m Steel Rails, Rail Ties, Elastomeric Pad, Screws, Baseplate, and Rail Clamps)	7	Nos		
4.3.1.7	Firewalls Between Auto-Transformers	8	Nos		
4.3.1.8	Foundation for 400kV GIB Bus Runs to AIS Equipment	1	Lot		
4.3.1.9	Foundation for 220kV GIB Bus Runs to AIS Equipment	1	Lot		
4.3.1.10	Foundation of 220kV Post Type Insulator Bus Support	1	Lot		
4.3.1.11	Foundation of 33kV Post Type Insulator Bus Support	1	Lot		
4.3.1.12	Foundation of Station Service Transformer	2	Nos		
4.3.1.13	Foundation of 72.5kV Circuit Breaker	2	Nos		
4.3.1.14	Foundation of 72.5kV Current Transformer	6	Nos		
4.3.1.15	Foundation of 33kV Single Phase Switches	1	Lot		
4.3.1.16	Foundation of 30kV,10kA Lightning arrester for line bays	6	Nos		
4.3.1.17	Foundations of 30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
4.3.1.18	Foundation of Diesel Generator Set & Fuel Tank	1	Nos		
4.3.1.19	Foundation for Lightning Mast as required for total protection of equipment	1	Lot		
4.3.1.20	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.3.1					
4.3.2	External Works and Landscaping				
4.3.2.1	Improvements of existing earthen access road to asphalted road up to substation	1	Lot		
4.3.2.2	Internal Paving	1	Lot		
4.3.2.3	Landscaping, Including Maintenance up to Taking Over	1	Lot		
4.3.2.4	Construction of reinforced concrete trenches/duct banks with manholes for all types of HV/MV power and control cables between switchgear building, substation control building and Autotransformer and all substation equipment as specified in Scope and Employers	1	Lot		
4.3.2.5	Anti-weed treatment & stone spreading along with cement concrete layer, Internal drainage system, external drainage system and Sewage handling as per the Employer's requirements.	1	Lot		
4.3.2.6	Superficial storm drainage system to drain water outside substation during heavy rainfall	1	Lot		
4.3.2.7	Parking Areas	1	Lot		
4.3.2.8	Guard House	1	Lot		
4.3.2.9	Substation Perimeter Fence	1	Lot		
4.3.2.10	Rain Water Harvesting as per the Employer's				
4.3.2.11	Firefighting Pump House and Water Tank	1	Lot		
4.3.2.12	Security Lighting along the Fence and Inside the	1	Lot		
4.3.2.13	Retaining wall as per the Employer's requirements	1	Lot		
4.3.2.14	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.3.2					
4.3.3	General				
4.3.3.1	Mobilization & Demobilization, Site Infrastructure, Temporary Works at site related to site activities.	1	Lot		
4.3.3.2	Final Cleanup (Including Removal of Excess Materials and Temporary Works) Demobilization	1	Lot		
4.3.3.3	Supply and Installation of Water Supply System as per the Employer's requirements	1	Lot		
4.3.3.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.3.3					
4.3.4	Substation Buildings				
4.3.4.1	Substation Control Building	1	Lot		

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Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in
		1	2	3	(1)x(3)
4.3.4.2	400kV GIS Building	1	Lot		
4.3.4.3	220kV GIS Building	1	Lot		
4.3.4.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above	1	Lot		
Sub Total 4.3.4					
Total Carried to SC-4					
Name of the Bidder:					
Signature of Bidder:					

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Schedule 4.4: Summary of Breakdown for Day work

Description	Amount in US\$
1. Sub-Total for Day work: Labor (4.4.1)	
2. Sub-Total for Day work: Materials (4.4.2)	
3. Sub-Total for Day work: Contractor's Equipment (4.4.3)	
Total (to be carried forward to Schedule 4.0)	
Name of the Bidder:	
Signature of Bidder:	

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Schedule of 4.4.1: Breakdown for Day work Rates: Labor

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in
4.4.1	Supervision and Labor				
4.4.1.1	Engineer	350	h		
4.4.1.2	Foreman	400	h		
4.4.1.3	Surveyor	150	h		
4.4.1.4	Technician	600	h		
4.4.1.5	Skilled labor	600	h		
4.4.1.6	Semiskilled labor	600	h		
4.4.1.7	Unskilled labor	600	h		
4.4.1.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		specify		
Total (Carried to SC-4.4)					
Name of the Bidder:					
Signature of Bidder:					
<i>Note: The labor rate should include all cost needed to provide the Labor at required place including all related cost for providing the labour, ensuring that the labor is qualified for his/her job and can perform the required task professionally.</i>					

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Schedule of 4.4.2: Breakdown for Day work Rates: Materials

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
4.4.2.1	Concrete Work				
4.4.2.1.1	Lean Concrete	50	m3		
4.4.2.1.2	Concrete to foundation	150	m3		
4.4.2.1.3	Concrete to superstructure	200	m3		
4.4.2.2	Steel Reinforcement				
4.4.2.2.1	Mild Steel reinforcement, including cutting, bending	10	t		
4.4.2.2.2	High tensile steel reinforcement, including cutting, bending	25	t		
4.4.2.3	Structural Steel				
4.4.2.3.1	Commercial sections, including cutting, welding, bolting	10	t		
4.4.2.4	Excavation Work				
4.4.2.4.1	Excavation in rock (type R), including shoring, backfill, haul and disposal	200	m3		
4.4.2.4.2	Ditto, in soil (type MB and LB)	400	m3		
4.4.2.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)				
4.4.2.6	Price for Control Point on Wave Switching Device (CPWSD) to be installed on 400kV Breaker supplied as per Schedule-2	1	No		
4.4.2.7	Price for Pre-Insertion Resistor (PIR) to be installed on 400kV Breaker supplied as per schedule-2	1	No		
4.4.2.8	Price for Stub-Bus Differential Protection for 400kV Future Bay	1	No		
4.4.2.9	Price for Stub-Bus Differential Protection for 220kV Future Bay	1	No		
Total (carried forward to SC-4.4)					
Name of the Bidder:					
Signature of Bidder:					
Note:					
<i>Note: Quoted Unit Price shall include all the cost required to perform task successfully such as loading, transportation, insurance, unloading, cutting (if required), placing as per intended required task, while insuring the quality of the material and health and safety, storing at proper storage place with security and carrying out works as per Employer's requirement and Conditions of Contract.</i>					

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Schedule No. 4.4.3 : Breakdown of Day work Rates: Contractor's Equipment

Item no.	Description	Nominal quantity	Unit	Basic hourly rental rate in US\$	Amount in US\$
4.4.3	Contractors' Equipment				
4.4.3.1	Concrete Mixer, up to 5 m3/h	20	h		
4.4.3.2	Concrete Mixer, above to 5 m3/h	20	h		
4.4.3.3	Concrete Pump (Self-Propelled) up to 20 m3/h	40	h		
4.4.3.4	Concrete Pump (Self-Propelled) above to 20 m3/h	40	h		
4.4.3.5	Concrete batch plant, up to 20 m3/h	20	h		
4.4.3.6	Concrete batch plant, above 20 m3/h	20	h		
4.4.3.7	Transit mixer, up to 5 m3	40	h		
4.4.3.8	Transit mixer, above to 5 m3	40	h		
4.4.3.9	Bulldozer, with ripper, up to CAT D8 class	50	h		
4.4.3.10	Bulldozer, with ripper, above to CAT D8 class	50	h		
4.4.3.11	Track loader, up CAT 953 class	30	h		
4.4.3.12	Track loader, above CAT 953 class	50	h		
4.4.3.13	Wheel loader, up to CAT 930 class	50	h		
4.4.3.14	Wheel loader, above CAT 930 class	50	h		
4.4.3.15	Track excavator	100	h		
4.4.3.16	Air Compressor	100	h		
4.4.3.17	Mobile crane, up to 10 t	50	h		
4.4.3.18	Mobile crane, above 10 t, up to 20 t	50	h		
4.4.3.19	Mobile crane, above 20 t	50	h		
4.4.3.20	Lorry, up to 10 t	100	h		
4.4.3.21	Lorry, above 10 t	100	h		
4.4.3.22	Tipper, up to 10 t	100	h		
4.4.3.23	Tipper, above 10 t	100	h		
4.4.3.24	Pick-up	200	h		
4.4.3.25	Diesel generator, up to 100 kW	100	h		
4.4.3.26	Diesel generator, above 100 kW, up to 250 kW	100	h		
4.4.3.27	Diesel generator, above 250 kW	100	h		
4.4.3.28	Welding Set, Including Welding Rods	300	h		
Total (Carried forward to SC-4.4)					
Name of the Bidder:					
Signature of Bidder:					
Note:					
<p><i>The Basic Hourly rates includes all cost that require to run and perform the task, such as Equipment rental with operator, maintenance of vehicle, running responsibility, health and safety protection, petrol, diesel, lubricants, driver, assistance etc. required for carrying the task with the equipment.</i></p>					

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Schedule No. 4.5 : Other Installation Services

Item no.	Description	Unit	Quantit	Unit Rate in US\$	Amount in US\$
4.5.1	Environmental, Social, Health and Safety Management Plan				
4.5.1.1	General Mitigation Measures				
4.5.1.1.1	Develop a detailed Environmental, Social, Health, and Safety (ESHS) Management Plan for Contractor's employees	Lot	1		
4.5.1.1.2	Develop, provide training and enforce a Worker Code of Conduct	Lot	1		
4.5.1.1.3	Conduct Employee Induction Training on H&S and environmental/social/cultural sensitivity	Lot	1		
4.5.1.1.4	Implement Community Grievance Redress Plar	Lot	1		
4.5.1.1.5	Personal Protection equipment all complete (Safety Boots, Reflection Jackets, Safety Helmet, Safety Goggles, Safety Mask, Safety earplugs, Safety hand gloves etc.)	Lot	1		
Sub Total 4.5.1.1					
4.5.1.2	Physical Environment Mitigation Measures				
4.5.1.2.1	Implement an Erosion and Sediment Control Plan	1	Lot		
4.5.1.2.2	Manage excavated soils	1	Lot		
4.5.1.2.3	Spray disturbed areas with water if substantive off-site fugitive dust impacts occur	1	Lot		
4.5.1.2.4	Provide a pit toilet and bury all organic wastes at tower construction sites	1	Lot		
4.5.1.2.5	Install septic systems/package and proper wastewater disposal system for workers	1	Lot		
4.5.1.2.6	Provide hazardous material training to concerned staff	1	Lot		
4.5.1.2.7	Stockpile materials for use in controlling spills	1	Lot		
4.5.1.2.8	Provide secondary containment for any fuel or hazardous	1	Lot		
4.5.1.2.9	Collect and segregate all waste for reuse, recycle, or disposal	1	Lot		
4.5.1.2.10	Dispose of solid waste at approved waste disposal facilities	1	Lot		
Sub Total 4.5.1.2					
4.5.1.3	Socio-economic and Cultural Environment Mitigation Measures				
4.5.1.3.1	Implement Workforce Management Plan	1	Lot		
4.5.1.3.2	Implement Worker Access Management Protocol	1	Lot		
4.5.1.3.3	Implement Traffic Management Plan and maintain the damaged roads caused by contractors	1	Lot		
4.5.1.3.4	Develop and Implement Worker Grievance Redress Mechanism	1	Lot		
4.5.1.3.5	Conduct community awareness on EMF risks	1	Lot		
Sub Total 4.5.1.3					
4.5.1.4	Gender, Social Inclusion and Counter-TIP Measures				
4.5.1.4.1	Develop and implement Anti-Sexual Harassment Policy, provide orientation to the entire workers	Lot	1		
4.5.1.4.2	Conduct awareness raising and community meetings to encourage women, socially excluded, historically marginalized, vulnerable groups to apply for jobs	Lot	1		
4.5.1.4.3	Develop and Implement TIP Risk Management Plar	Lot	1		
4.5.1.4.4	Training to the Contractor's employees/staff on Gender and Social Inclusion, prevention on sexual harassment, gender-based violence, child labor and TIP	Lot	1		
4.5.1.4.5	Community TIP risk prevention sensitization and community consultation	Lot	1		
4.5.1.4.6	Community Grievance Redress Plan must have system of Anonymous reporting for TIP suspected cases	Lot	1		

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Schedule No. 4.5 : Other Installation Services

Item no.	Description	Unit	Quantit	Unit Rate in US\$	Amount in US\$
Sub Total 4.5.1.4					
4.5.2	Testing And Commissioning				
4.5.2.1	Site Testing and Commissioning of HV AIS Equipment	1	Lot		
4.5.2.2	Site Testing and Commissioning of Autotransformers	1	Lot		
4.5.2.3	Site Testing and Commissioning of 400kV GIS Equipment	1	Lot		
4.5.2.4	Site Testing and Commissioning of 220kV GIS Equipment	1	Lot		
4.5.2.5	Site Testing and Commissioning of Electrical Auxiliary Service Equipment and Power MV and LV Cables	1	Lot		
4.5.2.6	Site Testing and Commissioning of Protection/Communication and Control (SCADA and SAS) equipment	1	lot		
4.5.2.7	Site Testing and Commissioning of Mechanical Auxiliary Service Equipment	1	Lot		
4.5.2.8	One Month Commercial Operation after Commissioning	1	Lot		
4.5.2.9	End to End Test for all points as specified, including Control, Protection & Remote End Modification	1	Lot		
4.5.2.10	Closed loop test of equipment all complete	1	Lot		
4.5.2.11	PQ (Power Quality), Revenue Energy meter and all remaining equipment of S/S	1	Lot		
4.5.2.12	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.5.2					
4.5.3	Training and O&M Assistance				
Training at Manufacturers Work					
4.5.3.1	Control & Protection, Substation Automation System and Communication System.(Refer PSR for more details)	1	Lot		
4.5.3.2	400 kV GIS Equipment and System (Circuit Breaker, Isolator, CT, PT & LA) and EHV GIS/AIS Substation Design (Refer PSR for more details)	1	Lot		
4.5.3.3	220 kV GIS Equipment and System (Circuit Breaker, Isolator, CT, PT & LA) and EHV GIS/AIS Substation Design (Refer PSR for more details)	1	Lot		
Training at Site					
4.5.3.4	Control & Protection (Refer PSR for more details)	1	Lot		
4.5.3.5	Substation Automation System including the integration aspect of SCADA (Refer PSR for more details)	1	Lot		
4.5.3.6	For 400kV Indoor GIS and Outdoor Switchyard Equipment (CT, CVT, Isolator and Circuit Breaker) Operation and Maintenance. (Refer PSR for more details)	1	Lot		
4.5.3.7	For 220kV Indoor GIS and Outdoor Switchyard Equipment (CT, CVT, Isolator and Circuit Breaker) Operation and Maintenance.(Refer PSR for more details)	1	Lot		
4.5.3.8	Operation and maintenance of Transformers (Refer PSR for more details)	1	Lot		
4.5.3.9	AC/DC auxiliaries and mechanical system (Refer PSR for more details)	1	Lot		
4.5.3.10	Training at site for other systems (provide list)	1	Lot		
Sub Total 4.5.3					
Total (Carried forward to SC-4)					
Name of the Bidder:					
Signature of Bidder:					

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Price Schedule No. 5 : Grand Summary

Item No	Description	Total Price in US\$
5.1	Total Schedule No. 1. Design Services	
5.2	Total Schedule No. 2. Plant, and Mandatory Spare Parts Supplied from Abroad	
5.3	Total Schedule No. 3. Plant, and Mandatory Spare Parts Supplied from within the Employer's Country	
5.4	Total Schedule No. 4. Installation and Other Services including all related Civil Works (Excluding Summary of Breakdown of Day works) (includes SC-4.1, SC-4.2, SC-4.3 and SC-4.5)	
5.5	TOTAL (to Bid Form - Resulting contract Price after correction if any)	
5.6	Output VAT (if applicable)	
5.7	Total including Output VAT (5.5+5.6)	
5.8	Total of Summary of Breakdown of Day works (to bid form) (from item No.4.6 of SC-4)	
5.9	Grand Total Including Day work for Evaluation and Comparison Purpose (5.5+5.8)	
Name of Bidder:		
Signature of Bidder:		
Note:		
<p><i>Quoted Unit Price shall include all the cost required to perform task successfully such as all resources required to carry out the Work, personnel, material, equipment, loading, transportation, insurance, unloading and storing at proper storage place and carrying out works as per Employer's requirement and Conditions of Contract.</i></p> <p><i>The purpose of price schedules is to identify the Bid Price which will be used to determine progress payment and the rates can be used to determine the price of any variation to scope . The Bid Price if accepted and included in the Contract shall become Contract Price and the Contract price shall not be adjusted (except as stated under Conditions of Contract under Sub-Clause 13.8) in case any quantity varies. The Price quoted under Price Schedule is as per provision of Employer's Requirements and Conditions of Contract.</i></p>		

Lot 2 Price Schedule

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Lot 2: 400kV New Butwal Substation
Price Schedule

Breakdown of Rates and Prices Schedule No. 1. Design Services

Item No	Description	Qty	Unit	Unit Rate	Total Price
		1		2	USS (1) x (2)
1.1	Design Works (Electrical)				
Complete Electromechanical and Electrical Design of New Substation as Specified in Scope and Employers Requirements including but					
1.1.1	Substation Design: (SLD, Layout, Section elevation, P&C, SCADA, 400/220kV Switchgear, Auto Transformers along with connections, Auxiliary System, Control, LV & Fiber Optic Cables along with connections for the same, etc.)	1	Lot		
1.1.2	Thermal Calculations for normal and emergency continuous current ratings of the switchgear and each main current path component	1	Lot		
1.1.3	Insulation Coordination Study	1	Lot		
1.1.4	Lightning Surge Overvoltage Study	1	Lot		
1.1.5	Transient Recovery Voltage (TRV) Study for GIS	1	Lot		
1.1.6	Grounding Analysis for entire station	1	Lot		
1.1.8	All the requested settings for Protection Coordination, Relay Test Plan, Configuration and Programming on Intelligent Electronic Device (IEDs such as Relays, RTUs, Automation system, etc. to ensure normal function of integrated system at substation and with other facilities in the entire power system as referred to LOT 2 works.	1	Lot		
1.1.9	GIS System Earthing and Bonding Study	1	Lot		
1.1.10	Outdoor Switchyard Lighting Study	1	Lot		
1.1.11	Power Cable Ampacity Study	1	Lot		
1.1.12	Rigid Bus Study	1	Lot		
1.1.13	Power Cable Pulling Tension Calculation	1	Lot		
1.1.14	Any other design work not specifically mentioned above but deemed necessary or as required by Engineer/Employer for satisfactory completion of design work.	1	Lot		
Sub Total 1.1					
1.2	Design Works (Civil)				
Complete Civil Design of New Substation as Specified in Scope and Employers Requirements including but not limited to:					
1.2.1	Geotechnical investigation data and drawings including on-site support during excavation and compaction.	1	Lot		
1.2.2	Hydrological, Environmental and Social Assessment of New Butwal Substation area as described in the Technical Specification	1	Lot		
1.2.3	Surveying and benchmarking design and drawings including on-site support during site preparation.	1	Lot		
1.2.4	Substation Design in Civil, Structural, Mechanical and Architectural, such as foundation works, hot dip galvanised steel supporting structures for all outdoor electrical equipment structures, other civil works like boundary wall etc., substation buildings, roads, cable trenches, water drainage system, oil containment chamber and sump pit, fire walls, earthing works, etc. of new substation complete in all respect.	1	Lot		
1.2.5	Design of rail tracks for movement of power transformers on the reinforced concrete foundations.	1	Lot		
1.2.6	Any Architectural-Related Calculations and Analysis	1	Lot		
1.2.7	Any Mechanical-Related Calculations and Analysis	1	Lot		
1.2.8	Any other design work not specifically mentioned above but deemed necessary or as required by employer for satisfactory completion of design work.	1	Lot		
Sub Total 1.2					
Total (To Schedule No. 5. Grand Summary)					
Name of Bidder:					
Signature of Bidder:					

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied from Abroad

Item No.	Description	Code (a)	Qty	Unit	Unit Rate (b)	Total Price (c)
					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
2.1	Design Works (Electrical)					
2.1.1	Auto-Transformer, 315 MVA, 400/220/33 kV, Three Phase, OLTC, RTCC facility, surge protection arrangement (AIS) on both sides including tertiary Bushing CT, all fittings & accessories as specified/ required for completion of the scope of works as per technical specification		3	Nos		
2.1.2	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application: Metering		6	Nos		
2.1.3	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application: Metering and PLC Coupling		6	Nos		
2.1.4	Current Transformer (CT), 400kV, Single Phase, Live tank Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA		12	Nos		
2.1.5	Current Transformer (CT), 220kV Single Phase, Tank Type, 5 Core, 1600A, 120% Extended Current Rating		9	Nos		
2.1.6	Current Transformer (CT), 72.5kV, Single Phase 2 Windings		6	Nos		
2.1.7	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV		12	Nos		
2.1.8	220kV Surge Arrester (SA), Zinc Oxide 216kV Rated Voltage, 10kA, 12kJ/kV		9	Nos		
2.1.9	Substation Service Transformer, 630 kVA, 33/0.4kV		2	Nos		
2.1.10	30kV,10kA Lightning arrester for 33kV line bays		6	Nos		
2.1.11	30kV,10kA Lightning arrester for 33/0.4kV station service transformers		6	Nos		
2.1.12	Tandem Isolator without Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)		9	Nos		
2.1.13	Isolator with One Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)		3	Nos		
2.1.14	Isolator with Two Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)		3	Nos		
2.1.15	72.5kV Double Break Isolator, Single Phase		1	Lot		
2.1.16	220kV Circuit Breaker, Three Phase, 1600A		3	Nos		
2.1.17	72.5kV Circuit Breaker, Three Phase, 50Hz.		2	Nos		
2.1.18	72.5kV Current Transformer		6	Nos.		
2.1.19	400kV Bus Support Post Insulator		1	Lot		
2.1.20	220kV Bus Support Post Insulator		1	Lot		
2.1.21	72.5kV Bus Support Post Insulator		1	Lot		
2.1.22	Suspension/Tension Insulator Strings, Including Hardware		1	Lot		
2.1.23	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
					Sub Total 2.1	
2.2	Hot-Dip Galvanized Steel					
2.2.1	Gantry Column for 400 kV Incoming Line		6	Nos		
2.2.2	Gantry Column for 220 kV Incoming Line		5	Nos		
2.2.3	Gantry Girder for 400 kV Incoming Line		4	Nos		
2.2.4	Gantry Girder for 220 kV Incoming Line		3	Nos		
2.2.5	Support Structure for 400 kV Current Transformer		12	Nos		
2.2.6	Support Structure for 400 kV Capacitor Voltage Transformer		12	Nos		
2.2.7	Support Structure for 400 kV Surge Arrester		12	Nos		
2.2.8	Support Structure for 400 kV Bus Support		1	Lot		
2.2.9	Support Structure for Tandem Isolator without Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)		9	Nos		
2.2.10	Support Structure for Isolator with One Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)		3	Nos		
2.2.11	Support Structure for Isolator with Two Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)		3	Nos		
2.2.12	Support Structure for 72.5 kV Disconnecting Switch		1	Lot		
2.2.13	Support Structure for 220 kV Current Transformer		9	Nos		
2.2.14	Support Structure for 220 kV Surge Arrester		9	Nos		
2.2.15	Support Structure for 220 kV Bus Support		1	Lot		
2.2.16	Support Structure for 72.5 kV Current Transformer		6	Nos		
2.2.17	Support Structure for 72.5 kV Bus Support or Pot Head		1	Lot		
2.2.18	Support Structure for 72.5 kV Single Switch Stand		1	Lot		
2.2.19	Support Structure for 30kV Lightning Arrestor		15	Nos.		
2.2.20	Structures for Lightning Mast and other Lighting structures		1	Lot		
2.2.21	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
					Sub Total 2.2	

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied from Abroad

Item No.	Description	Code (a)	Qty	Unit	Unit Rate (b)	Total Price (c)
					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
2.3	Bus Bar and Overhead Connections					
2.3.1	5" AL Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness		1	Lot		
2.3.2	4" AL Tubular Bus Bar 114.2mm Outer Diameter, 8.51mm Thickness		1	Lot		
2.3.3	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)		1	Lot		
2.3.4	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel		1	Lot		
2.3.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
					Sub Total 2.3	
2.4	LV Control and Power Cable					
2.4.1	LV Control Cables		1	Lot		
2.4.2	LV Power Cables		1	Lot		
2.4.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)		1	Lot		
2.4.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)		1	Lot		
2.4.5	33 kV Cable Pothead		1	Lot		
2.4.6	Power Cable for Filter Plant (Transformer) 3.5CX240 sq.mm. (Armoured, PVC Insulated) with suitable termination arrangement all complete		1	Lot		
2.4.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.		1	Lot		
2.4.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
					Sub Total 2.4	
2.5	AC AND DC STATION SUPPLY					
2.5.1	400 V AC Main Switch Board					
2.5.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers		3	Nos		
2.5.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers		1	Nos		
2.5.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer		1	Nos		
2.5.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer		1	Nos		
2.5.2	400 V AC Main Lighting Board					
2.5.2.1	100 kVA Lighting Transformer		2	Nos		
2.5.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker		1	Nos		
2.5.3	400 V AC Emergency Lighting Distribution Board					
2.5.3.1	100 kVA Lighting Transformer		1	Nos		
2.5.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker		1	Nos		
2.5.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers,		1	Nos		
2.5.4	400 V AC Distribution Board					
2.5.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers		1	Nos		
2.5.4.2	400/110V, 50VA, Potential Transformer		3	Nos		
2.5.4.3	400/1A Current Transformer, Class 5P20		1	Nos		
2.5.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers		1	Nos		
2.5.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker		1	Nos		

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Item No.	Description	Code (a)	Qty	Unit	Unit Rate (b)	Total Price (c)
					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
2.5.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers		1	Nos		
2.5.5	400 V AC AMF Panel					
2.5.5.1	400/1A Current Transformer, Class 1		3	Nos		
2.5.5.2	400/1A Current Transformer, Class 5P20		1	Nos		
2.5.6	DC Chargers and Batteries					
2.5.6.1	220V Battery Charger (Float/Boost)		3	Nos		
2.5.6.2	48V Battery charger (Float/Boost)		3	Nos		
2.5.6.3	250A Throw over Switch, Interlock		6	Nos		
2.5.6.4	Battery, 220Vdc, 108 Minimum Cells		2	Nos		
2.5.6.5	Battery, 48Vdc, 24 Minimum Cells		2	Nos		
2.5.7	DC Distribution Boards					
2.5.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions		2	Nos		
2.5.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions		2	Nos		
2.5.7.3	DC Fuse Box, 220Vdc		1	Lot		
2.5.7.4	DC Fuse Box, 48Vdc		1	Lot		
2.5.8	Other Equipment					
2.5.8.1	Diesel Generator Set, 250kVA (Including Fuel Tank)		1	Nos		
2.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.5						
2.6	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)					
2.6.1	Line/feeder Bay					
2.6.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole		10	Nos		
2.6.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set		20	Nos		
2.6.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set		20	Nos		
2.6.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		20	Nos		
2.6.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set		10	Nos		
2.6.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set		10	Nos		
2.6.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set		10	Nos		
2.6.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		10	Nos		
2.6.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker		10	Nos		
2.6.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)		10	Nos		
2.6.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices		1	Lot		
2.6.1.12	All metallic structures and supports required for GIS complete with accessories		1	Lot		
2.6.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices		1	Lot		
2.6.1.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Line/Feeder Bay Lot all complete		10	Bays		
2.6.2	Transformer Bay					
2.6.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device		4	Nos		
2.6.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set		8	Nos		
2.6.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single phase, three-phase set		8	Nos		
2.6.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		8	Nos		
2.6.2.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set		4	Nos		
2.6.2.6	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set		4	Nos		
2.6.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set		4	Nos		
2.6.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set		4	Nos		

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			2		3	(1) x (3)
2.6.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)		4	Nos		
2.6.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)		4	Nos		
2.6.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices		1	Lot		
2.6.2.12	All metallic structures and supports required for GIS complete with accessories		1	Lot		
2.6.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices		1	Lot		
2.6.2.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Transformer Bay Lot all complete		4	Bays		
2.6.3	Diameter Middle Breaker Bay					
2.6.3.1	SF6 Circuit breaker					
a.	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole		3	Nos		
b.	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device		4	Nos		
2.6.3.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set		14	Nos		
2.6.3.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single phase, three-phase set		14	Nos		
2.6.3.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		14	Nos		
2.6.3.5	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)		7	Nos		
2.6.3.6	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)		7	Nos		
2.6.3.7	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices		1	Lot		
2.6.3.8	All metallic structures and supports required for GIS complete with accessories		1	Lot		
2.6.3.9	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices		1	Lot		
2.6.4	Gas Insulated BUSBAR					
2.6.4.1	400kV , 3 single phase (isolated), SF6 gas insulated , metal enclosed 4000A bus bars each enclosed in three individual bus enclosures		7	Diameter		
2.6.4.2	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set		2	Nos		
2.6.4.3	High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set		2	Nos		
2.6.4.4	Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set		2	Nos		
2.6.4.5	Bus Bar Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set		2	Nos		
2.6.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.6						
2.7	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.					
2.7.1	Complete set of Control and Protection panels for 400 kV station as specified in Scope and Employers Requirements including but					
2.7.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)		21	Nos		
2.7.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)		8	Nos		
2.7.1.3	Transformer Protection Panel		6	Nos		
2.7.1.4	400kV (Double Bus Bar Protection)		2	Set		
2.7.1.5	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
2.7.2	Complete set of Control and Protection panels for 220 kV station as specified in Scope and Employers Requirements including but					
2.7.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)		4	Nos		
2.7.2.2	Transformer Protection Panel		6	Nos		
2.7.2.3	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
2.7.3	Complete set of Control and Protection panels for 33 kV station as specified in Scope and Employers Requirements including but					
2.7.3.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)		2	Nos		

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					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
2.7.3.2	Transformer Protection Panel		2	Nos		
2.7.3.3	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
2.7.4	Substation Automation & Metering					
2.7.4.1	SAS Operator Station for control of 400/220/33 kV		1	Set		
2.7.4.2	Substation Automation System (SAS) for 400 kV System per diameter		7	Set		
2.7.4.3	Integration/connection of proposed 3 nos of 220 kV ICT bays with existing 220kV SAS system.		1	Lot		
2.7.4.4	Substation Automation System (SAS) for 33kV System per feeder		2	Set		
2.7.4.5	Substation Automation System (SAS) for Auxiliary System		1	Set		
2.7.4.6	Integration of all 400kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.		1	Lot		
2.7.4.7	Telecommunication system for New Butwal		1	Lot		
2.7.4.8	Fibre Optic SDH System		1	Lot		
2.7.4.9	Phone System		1	Lot		
2.7.4.10	Line traps (4 required), complete with hardware and supporting material, and the power line carrier equipment, complete with necessary coupling equipment and cables for 2 sets of PLCC system complete.		1	Lot		
2.7.4.11	400 kV Metering		1	Lot		
2.7.4.12	220kV Metering		1	Lot		
2.7.4.13	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
Sub Total 2.7						
2.8	Grounding System					
2.8.1	Stranded Bare Copper 240 Sq. mm** Grid (Including Fusion and Mechanical Connectors)		1	Lot		
2.8.2	Grounding Rods		1	Lot		
2.8.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)		1	Lot		
2.8.4	Embedded Grounding System - Control Room		1	Lot		
2.8.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.8						
2.9	Lightning Protection System					
2.9.1	Overhead Galvanized Steel Wire, Including Hardware		1	Lot		
2.9.2	Lightening Mast for equipment Protection		1	Lot		
2.9.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.9						
2.10	Firefighting System					
2.10.1	Fire protection/detection for 3 (three) auto transformers		1	Lot		
2.10.2	Fire protection/detection for 400kV GIS Building		1	Lot		
2.10.3	Fire protection/detection for Control House		1	Lot		
2.10.4	Fire protection/detection system for pump house building		1	Lot		
2.10.5	Fire protection/detection system for generator diesel tank		1	Lot		
2.10.6	Portable fire extinguishers		1	Lot		
2.10.7	Clean-agent fire extinguishers		1	Lot		
2.10.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.10						
2.11	HVAC And Ventilation Systems					
2.11.1	400kV GIS Building HVAC and Ventilation Systems		1	Lot		
2.11.2	Control House HVAC and Ventilation Systems		1	Lot		
Sub Total 2.11						
2.12	Accessories and Ancillary Material					
2.12.1	Junction and marshalling boxes, outdoor		1	Lot		
2.12.2	Junction and marshalling boxes, indoor		1	Lot		
2.12.3	Outdoor lighting, including lighting fixtures		1	Lot		
2.12.4	Indoor lighting, including lighting fixtures		1	Lot		
2.12.5	Control Cabinet for outdoor lighting		1	Lot		
2.12.6	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.		1	Lot		
2.12.7	Electric Overhead Travelling Crane for installation and removal of GIS Equipment		1	Lot		
2.12.8	Visual Monitoring System		1	Lot		
2.12.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		

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					3	(1) x (3)
Sub Total 2.12						
2.13	Mandatory Maintenance, Repair tools and Testing Instruments					
2.13.1	GIS Equipment					
2.13.1.1	400kV GIS SF6 leakage detector, analyzer and processing unit all complete		1	Lot		
2.13.1.2	400kV GIS Wrenches and tools		1	Lot		
2.13.1.3	400kV GIS Pressure gauge		1	Nos		
2.13.1.4	400kV GIS Gas sampling and moisture meter		1	Nos		
2.13.1.5	400kV GIS Micro-Ohmmeter		1	Nos		
2.13.1.6	400kV GIS Circuit-breaker, timing tester		1	Nos		
2.13.1.7	400kV GIS Laptop computer with Specialized software for GIS setting and monitoring		1	Nos		
2.13.1.8	Complete set of SF6 gas service cart mounted on a trailer for mobile application. SF6 gas refilling cart equipped with 1 SF6 gas cylinder and the necessary instruments and adapters for easy and quick gas refilling in case of losses		1	Lot		
2.13.1.9	HV Test Bushing for GIS		1	Lot		
2.13.1.10	Online Partial Discharge Monitor System		1	Nos		

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					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
2.13.2	<u>Auto Transformer</u>					
2.13.2.1	Oil-treatment unit 6000lph along with suitable size and quantity of connection arrangement (MCCB (240-300 Amp),terminal lugs etc.) all complete (autotransformer)		1	Nos		
2.13.2.2	Oil dielectric tester		1	Nos		
2.13.2.3	Dielectric tester based on tan δ and dielectric losses , 10 kV		1	Nos		
2.13.2.4	Megger, electronic, 5 kV		1	Nos		
2.13.2.5	Wrenches and tools		1	Lot		
2.13.3	<u>Complete set of Control and Protection panels for Substation</u>					
2.13.3.1	Relay Test Kit		1	Lot		
2.13.3.2	Test Equipment & tools for SAS SYSTEM for measuring, configuration & diagnostics.		1	Lot		
2.13.3.3	Coupling Device without base plate (For PLCC)		2	Sets		
2.13.3.4	Co-axial connector (For PLCC)		10	Nos		
2.13.3.5	Co-axial cable (For PLCC)		500	M		
2.13.3.6	PLCC tool kit		1	Set		
2.13.3.7	Line Trap LA		1	No		
Sub Total 2.13						
2.14	<u>Mandatory Spare Parts</u>					
2.14.1	<u>HV Equipment</u>					
2.14.1.1	Unit of 400kV surge arrester, complete with grading ring, terminals and surge counter		1	Lot		
2.14.1.2	Capacitive voltage transformer, 400kV		1	Nos		
2.14.1.3	Current transformer, 400kV		1	Nos		
2.14.1.4	Current transformer, 220kV		1	Nos		
2.14.1.5	Current transformer, 72.5kV		1	Nos		
2.14.2	<u>Auto Transformer</u>					
2.14.2.1	Complete set of gaskets with grease, for cover, manholes, hand holes, and pipping fittings.		1	Lot		
2.14.2.2	Lot of LV control and protective components, minimum one unit of each type of components used		1	Lot		
2.14.2.3	Pressure relief device, complete with accessories		1	Lot		
2.14.2.4	Bushings, one complete unit of each type used, with accessories		1	Lot		
2.14.2.5	Current transformer, one unit of each type		1	Nos		
2.14.2.6	Oil-circulating pump with motor, complete with accessories		1	Lot		
2.14.2.7	Cooling fan, complete with motor		1	Lot		
2.14.2.8	Buchholz relay, complete		1	Nos		
2.14.2.9	One instrument of each type used (temperature, oil level, pressure vent, etc.)		1	Lot		
2.14.2.10	One valve of each type used		1	Lot		
2.14.2.11	Insulating oil, 5% of the volume used		1	Lot		
2.14.2.12	Silica gel, quantity for one load		1	Lot		
2.14.2.13	Tap changer diverter switch, spare contacts and transition resistance		1	Nos		
2.14.2.14	Tap changer selector switch spare contacts		1	Lot		
2.14.2.15	Rolls of Kraft insulating paper		1	Nos		
2.14.2.16	LA with accessories for HV,IV and LV side		1	Lot		
2.14.2.17	Additional spare parts as per Chapter 3: Auto Transformer Specification of Part 2: Employer's Requirements, Section V – B1 (Technical		1	Lot		
2.14.3	<u>630kVA Transformer</u>					
2.14.3.1	All Bushing with metal parts (each voltage rating) for 630 KVA Transformer		1	Lot		
2.14.3.2	Oil Temperature Indicator with sensing device		1	Lot		
2.14.3.3	Tap Changer Contacts		1	Lot		
2.14.3.4	Buchholz Relay		1	Nos		
2.14.3.5	Explosion vent diaphragm		1	Nos		
2.14.3.6	Set of valve (each type)		1	Lot		
2.14.3.7	3-Phase 33 kV Horn Gap Fuse		1	Lot		
2.14.3.8	LA with accessories for both sides		1	Lot		
2.14.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.14						
2.15	<u>Spare Parts for AC and DC Station Supply</u>					
2.15.1	<u>Spare for LV Switchgear</u>					
2.15.1.1	LV circuit breaker, complete, with CT's and protection devices		1	Nos		
2.15.1.2	Outgoing thermomagnetic breakers - one unit of each type used		2	Nos		
2.15.1.3	Metering - one instrument of each type used		1	Nos		
2.15.1.4	Protection (other than included in LV breaker)		1	Nos		
	One unit of each type used					

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					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
2.15.1.5	Automatic Transfer Switch One complete controller including sensors		1	Nos		
2.15.1.6	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.		1	Nos		
2.15.2	Spare for DC Distribution Panels					
2.15.2.1	Thermomagnetic breakers one unit of each type used		1	Nos		
2.15.2.2	Metering - one metering instrument of each type used		1	Nos		
2.15.2.3	Protection (other than included in LV breaker) One unit of each type used		1	Nos		
2.15.2.4	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.		1	Nos		
2.15.3	Spare for Diesel Generator Set					
2.15.3.1	Replaceable elements for air filter		1	Nos		
2.15.3.2	Replaceable elements for oil filter		1	Nos		
2.15.3.3	Replaceable elements for fuel filter		1	Nos		
2.15.3.4	Complete set of injectors		1	Nos		
2.15.3.5	Fuel injector pump		1	Nos		
2.15.3.6	Oil pump		1	Nos		
2.15.3.7	Intake valves		1	Nos		
2.15.3.8	Seats for intake valves		1	Nos		
2.15.3.9	Exhaust valves		1	Nos		
2.15.3.10	Set for exhaust valves		1	Nos		
2.15.3.11	Disconnect switch, with grounding blades, 245 kV, 3 Ø		1	Nos		
2.15.3.12	Set of pistons		1	Nos		
2.15.3.13	Set of complete bearings of the engine		1	Nos		
2.15.3.14	Set of all gaskets needed for the engine		1	Nos		
2.15.3.15	Set of thermostats		1	Nos		
2.15.3.16	Set of bearings for the alternator		1	Nos		
2.15.3.17	Set of control cards, at least one unit of each type used		1	Nos		
2.15.3.18	Diodes and thyristors of each type used		3	Nos		
2.15.3.19	Lamp, one unit of each type used		10	Nos		
2.15.3.20	Auxiliary relay, one unit of each type used		1	Nos		
2.15.3.21	Multifunction metering instrument		1	Nos		
2.15.3.22	Voltage and speed regulator component and actuator		1	Nos		
2.15.3.23	Controller components		1	Nos		
2.15.3.24	Instrument, detectors		1	Nos		
2.15.4	Spare for Batteries					
2.15.4.1	One unit of battery used in 220 V DC system		1	Nos		
2.15.4.2	Loose parts for 220 V DC - connection elements, cables, links, etc.		1	Nos		
2.15.4.3	One unit of battery used in 48 Vdc system		1	Nos		
2.15.4.4	Loose parts for 48 V DC - connection elements, cables, links, etc.		1	Nos		
2.15.5	Spare for Battery Chargers					
2.15.5.1	Complete bridge of thyristors assembled on a cooling base		1	Nos		
2.15.5.2	Controller, complete including each type of card used		1	Nos		
2.15.5.3	Loose elements - auxiliary relays, breakers, metering instruments, control switches, fuses, etc.		1	Nos		
2.15.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.15						
2.16	Mandatory spare parts - Miscellaneous material					
2.16.1	Junction and marshalling boxed, outdoor, one of each type used		1	Nos		
2.16.2	Junction and marshalling boxed, indoor, one of each type used		1	Nos		
2.16.3	Outdoor lighting fixture, one unit of each type used		1	Nos		
2.16.4	Post-type insulator, one unit of each type used		1	Nos		
2.16.5	Suspension insulator, 5% of the total used		1	Nos		
2.16.6	Bus bar (rigid and strain) hardware, including, connectors, terminals, separator, corona rings, 5% of each type used, minimum one unit		1	Nos		
2.16.7	Grounding conductors, 5% of the installed conductors (stranded copper conductor, rectangular-shape copper bar and grounding rod)		1	Nos		
2.16.8	Fusion connection material, including molds, welding powder and installation tools, quantity required to make 5% of the total executed		1	Nos		
2.16.9	Mechanical connectors for grounding, 5% of the total executed connections		1	Nos		
2.16.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied from Abroad

Item No.	Description	Code (a)	Qty	Unit	Unit Rate (b)	Total Price (c)
					US\$ DDP plus all related cost as defined in foot note	US\$
				2	3	(1) x (3)
Sub Total 2.16						
2.17	Mandatory spare parts for 400kV GIS					
2.17.1	Spare Gas					
2.17.1.1	SF6 bottles required to fill the two largest volume compartments		1	Lot		
2.17.2	Circuit Breakers, 4000 A, 50kA					
2.17.2.1	Circuit breaker, complete pole assembly		1	Lot		
2.17.2.2	Complete sets of main contacts		1	Lot		
2.17.2.3	Complete sets of arcing contacts		2	Lot		
2.17.2.4	Operating mechanism, complete		1	Lot		
2.17.2.5	Closing coils		4	Lot		
2.17.2.6	Tripping coils		4	Lot		
2.17.3	Disconnect-Switches, 4000 A					
2.17.3.1	Disconnect-Switch, complete pole		1	Nos		
2.17.3.2	Complete set of contacts		2	Nos		
2.17.3.3	Operating mechanism, complete		1	Nos		
2.17.3.4	Operating mechanism motor		2	Nos		
2.17.4	Maintenance Earthing Switches					
2.17.4.1	Earthing-Switch, complete pole		1	Nos		
2.17.4.2	Complete set of contacts		2	Nos		
2.17.4.3	Operating mechanism, complete		1	Nos		
2.17.4.4	Operating mechanism motor		2	Nos		
2.17.5	High-speed earthing Switches					
2.17.5.1	High-speed earthing switch, complete pole		1	Nos		
2.17.5.2	Complete set of contacts		2	Nos		
2.17.5.3	Operating mechanism, complete		1	Nos		
2.17.5.4	Operating mechanism motor		2	Nos		
2.17.6	Other Equipment					
2.17.6.1	Voltage transformer, 400 kV, complete with disconnecting and earthing switch		3	Nos		
2.17.6.2	Current transformer, metering core, loose part		6	Nos		
2.17.6.3	Current transformer, protection core, loose part		6	Nos		
2.17.7	400kV GIS Bay, Local Control Cabinet					
2.17.7.1	One Bay Local Control Cabinet complete, wired, with all specified devices		1	Lot		
2.17.8	Bus Bar Elements					
2.17.8.1	Bus conductor elements		1	Lot		
2.17.8.2	Bus connection elements		1	Lot		
2.17.8.3	GIS insulators, one of each type used		1	Lot		
2.17.8.4	Pressure relief elements		1	Lot		
2.17.9	SF6-to-Air Bushing Modules					
2.17.9.1	SF6-to-air bushing module, 400 kV, single phase		1	Lot		
2.17.10	Loose Spare Parts					
2.17.10.1	5% of auxiliary relays, control devices, fuses, terminal blocks, etc. minimum one unit of each type used		1	Lot		
2.17.11	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.17						
2.18	Spare of LV control and power cables					
2.18.1	LV control cable, 5% of the installed cables		1	Lot		
2.18.2	LV power cable, 5% of the installed cables		1	Lot		
2.18.3	Cable installation accessories - 5% of the installed material		1	Lot		
2.18.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.18						
2.19	Spare parts of Mechanical Equipment					
2.19.1	Fire protection					
2.19.1.1	Fire protection/detection for auto transformer - one unit of each type used		1	Lot		
2.19.1.2	Clean-agent fire extinguisher		1	Lot		
2.19.1.3	Control Building general fire protection/detection system, one unit of each component used		1	Lot		
2.19.1.4	GIS Building general fire protection/detection system, one unit of each component used		1	Lot		
2.19.2	Control building HVAC system					
2.19.2.1	Throwaway air filters per air conditioning unit		1	Lot		
2.19.2.2	Pulley belts per air conditioning unit motor		1	Lot		
2.19.2.3	Thermostat per air conditioning unit		1	Lot		
2.19.3	GIS building ventilation system					
2.19.3.1	Throwaway air filters per ventilation system		1	Lot		

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Item No.	Description	Code (a)	Qty	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
				2	3	<i>(1) x (3)</i>
2.19.3.2	Pulley belts per ventilation unit motor		1	Lot		
2.19.3.3	Thermostat per ventilation unit		1	Lot		
2.19.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.19						
Total(Carried forward to Grand SC-5)						
Name of Bidder:						
Signature of Bidder:						
Note:						
<i>***: This value is indicative, the Contractor will validate as per item 1.1.6 of Design Works (Electrical)</i>						

Country of Origin Declaration Form		
Item No.	Description	Code

Note : Bidders shall enter the full name of the country of origin of all imported plant and equipment. Enter the code as per the Country of Origin

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.1	Design Works (Electrical)				
3.1.1	Auto-Transformer, 315 MVA, 400/220/33 kV, Three Phase, OLTC, RTCC facility, surge protection arrangement (AIS) on both sides including tertiary, Bushing CT, all fittings & accessories as specified/ required for completion of the scope of works as per technical specification	3	Nos		
3.1.2	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	6	Nos		
3.1.3	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application: Metering and PLC Coupling	6	Nos		
3.1.4	Current Transformer (CT), 400kV, Single Phase, Live tank Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	12	Nos		
3.1.5	Current Transformer (CT), 220kV Single Phase, Tank Type, 5 Core, 1600A, 120% Extended Current Rating	9	Nos		
3.1.6	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
3.1.7	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	12	Nos		
3.1.8	220kV Surge Arrester (SA), Zinc Oxide 216kV Rated Voltage, 10kA, 12kJ/kV	9	Nos		
3.1.9	Substation Service Transformer, 630 kVA, 33/0.4kV	2	Nos		
3.1.10	30kV, 10kA Lightning arrester for 33kV line bays	6	Nos		
3.1.11	30kV, 10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
3.1.12	Tandem Isolator without Earthing Switch, 220kV, 1600 A, 50kA, Three Phase (Set of 3)	9	Nos		
3.1.13	Isolator with One Earthing Switch, 220kV, 1600 A, 50kA, Three Phase (Set of 3)	3	Nos		
3.1.14	Isolator with Two Earthing Switch, 220kV, 1600 A, 50kA, Three Phase (Set of 3)	3	Nos		
3.1.15	72.5kV Double Break Isolator, Single Phase	1	Lot		
3.1.16	220kV Circuit Breaker, Three Phase, 1600A	3	Nos		
3.1.17	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
3.1.18	72.5kV Current Transformer	6	Nos.		
3.1.19	400kV Bus Support Post Insulator	1	Lot		
3.1.20	220kV Bus Support Post Insulator	1	Lot		
3.1.21	72.5kV Bus Support Post Insulator	1	Lot		
3.1.22	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
3.1.23	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 3.1	
3.2	Hot-Dip Galvanized Steel				
3.2.1	Gantry Column for 400 kV Incoming Line	6	Nos		
3.2.2	Gantry Column for 220 kV Incoming Line	5	Nos		
3.2.3	Gantry Girder for 400 kV Incoming Line	4	Nos		
3.2.4	Gantry Girder for 220 kV Incoming Line	3	Nos		
3.2.5	Support Structure for 400 kV Current Transformer	12	Nos		
3.2.6	Support Structure for 400 kV Capacitor Voltage Transformer	12	Nos		
3.2.7	Support Structure for 400 kV Surge Arrester	12	Nos		
3.2.8	Support Structure for 400 kV Bus Support	1	Lot		
3.2.9	Support Structure for Tandem Isolator without Earthing Switch, 220kV, 1600 A, 50kA, Three Phase (Set of 3)	9	Nos		
3.2.10	Support Structure for Isolator with One Earthing Switch, 220kV, 1600 A, 50kA, Three Phase (Set of 3)	3	Nos		
3.2.11	Support Structure for Isolator with Two Earthing Switch, 220kV, 1600 A, 50kA, Three Phase (Set of 3)	3	Nos		
3.2.12	Support Structure for 72.5 kV Disconnecting Switch	1	Lot		
3.2.13	Support Structure for 220 kV Current Transformer	9	Nos		
3.2.14	Support Structure for 220 kV Surge Arrester	9	Nos		
3.2.15	Support Structure for 220 kV Bus Support	1	Lot		
3.2.16	Support Structure for 72.5 kV Current Transformer	6	Nos		
3.2.17	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
3.2.18	Support Structure for 72.5 kV Single Switch Stand	1	Lot		
3.2.19	Support Structure for 30kV Lightning Arrestor	15	Nos.		
3.2.20	Structures for Lightning Mast and other Lighting structures	1	Lot		
3.2.21	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
Sub Total 3.2					
3.3	Bus Bar and Overhead Connections				
3.3.1	5" AL Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
3.3.2	4" AL Tubular Bus Bar 114.2mm Outer Diameter, 8.51mm Thickness	1	Lot		
3.3.3	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		
3.3.4	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		
3.3.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.3					
3.4	LV Control and Power Cable				
3.4.1	LV Control Cables	1	Lot		
3.4.2	LV Power Cables	1	Lot		
3.4.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		
3.4.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		
3.4.5	33 kV Cable Pothead	1	Lot		
3.4.6	Power Cable for Filter Plant (Transformer) 3.5CX240 sq.mm. (Armoured, PVC Insulated) with suitable termination arrangement all complete	1	Lot		
3.4.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
3.4.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.4					
3.5	AC AND DC STATION SUPPLY				
3.5.1	400 V AC Main Switch Board				
3.5.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
3.5.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
3.5.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
3.5.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
3.5.2	400 V AC Main Lighting Board				
3.5.2.1	100KVA Lighting Transformer	2	Nos		
3.5.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
3.5.3	400 V AC Emergency Lighting Distribution Board				
3.5.3.1	100KVA Lighting Transformer	1	Nos		
3.5.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker	1	Nos		
3.5.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers,	1	Nos		
3.5.4	400 V AC Distribution Board				
3.5.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
3.5.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
3.5.4.3	400/1A Current Transformer, Class 5P20	1	Nos		
3.5.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers	1	Nos		
3.5.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.5.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
3.5.5	400 V AC AMF Panel				
3.5.5.1	400/1A Current Transformer, Class 1	3	Nos		
3.5.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
3.5.6	DC Chargers and Batteries				
3.5.6.1	220V Battery Charger (Float/Boost)	3	Nos		
3.5.6.2	48V Battery charger (Float/Boast)	3	Nos		
3.5.6.3	250A Throw over Switch, Interlock	6	Nos		
3.5.6.4	Battery, 220Vdc, 108 Minimum Cells	2	Nos		
3.5.6.5	Battery, 48Vdc, 24 Minimum Cells	2	Nos		
3.5.7	DC Distribution Boards				
3.5.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
3.5.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
3.5.7.3	DC Fuse Box, 220Vdc	1	Lot		
3.5.7.4	DC Fuse Box, 48Vdc	1	Lot		
3.5.8	Other Equipment				
3.5.8.1	Diesel Generator Set, 250kVA (Including Fuel Tank)	1	Nos		
3.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.5					
3.6	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
3.6.1	Line/feeder Bay				
3.6.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	10	Nos		
3.6.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set	20	Nos		
3.6.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	20	Nos		
3.6.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	20	Nos		
3.6.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set	10	Nos		
3.6.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set	10	Nos		
3.6.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	10	Nos		
3.6.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	10	Nos		
3.6.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	10	Nos		
3.6.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	10	Nos		
3.6.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.1.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Line/Feeder Bay Lot all complete	10	Bays		
3.6.2	Transformer Bay				
3.6.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
3.6.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	8	Nos		
3.6.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	8	Nos		
3.6.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	8	Nos		
3.6.2.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	4	Nos		
3.6.2.6	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set	4	Nos		
3.6.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	4	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.6.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set	4	Nos		
3.6.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
3.6.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
3.6.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.2.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Transformer Bay Lot all complete	4	Bays		
3.6.3	Diameter Middle Breaker Bay				
3.6.3.1	SF6 Circuit breaker				
a.	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	3	Nos		
b.	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
3.6.3.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	14	Nos		
3.6.3.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	14	Nos		
3.6.3.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	14	Nos		
3.6.3.5	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	7	Nos		
3.6.3.6	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	7	Nos		
3.6.3.7	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.3.8	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.3.9	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.4	Gas Insulated BUSBAR				
3.6.4.1	400kV , 3 single phase (isolated), SF6 gas insulated , metal enclosed 4000A bus bars each enclosed in three individual bus enclosures	7	Diameter		
3.6.4.2	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set	2	Nos		
3.6.4.3	High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	2	Nos		
3.6.4.4	Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set	2	Nos		
3.6.4.5	Bus Bar Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	2	Nos		
3.6.4.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.6					
3.7	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.				
3.7.1	Complete set of Control and Protection panels for 400 kV station as specified in Scope and Employers Requirements including but not limited to:				
3.7.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	21	Nos		
3.7.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)	8	Nos		
3.7.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no, Auto Trans Bay 2=1no)	6	Nos		
3.7.1.4	400kV (Double Bus Bar Protection)	2	Set		
3.7.1.5	Miscellaneous Relay and Control Equipment, not included above	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.7.2	Complete set of Control and Protection panels for 220 kV station as specified in Scope and Employers Requirements including but not limited to:				
3.7.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	4	Nos		
3.7.2.2	Transformer Protection Panel (Auto Trans Bay 1=Ino,Auto Trans Bay 2=Ino)	6	Nos		
3.7.2.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.7.3	Complete set of Control and Protection panels for 33 kV station as specified in Scope and Employers Requirements including but not limited to:				
3.7.3.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
3.7.3.2	Transformer Protection Panel	2	Nos		
3.7.3.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.7.3.4	Substation Automation & Metering				
3.7.3.4.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
3.7.3.4.2	Substation Automation System (SAS) for 400 kV System per diameter	7	Set		
3.7.3.4.3	Integration/connection of proposed 3 nos of 220 kV ICT bays with existing 220kV SAS system.	1	Lot		
3.7.3.4.4	Substation Automation System (SAS) for 33kV System per feeder	2	Set		
3.7.3.4.5	Substation Automation System (SAS) for Auxiliary System	1	Set		
3.7.3.4.6	Integration of all 400kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
3.7.3.4.7	Telecommunication system for New Butwal	1	Lot		
3.7.3.4.8	Fibre Optic SDH System	1	Lot		
3.7.3.4.9	Phone System	1	Lot		
3.7.3.4.10	Line traps (4 required), complete with hardware and supporting material, and the power line carrier equipment, complete with necessary coupling equipment and cables for 2 sets of PLCC system complete.	1	Lot		
3.7.3.4.11	400 kV Metering	1	Lot		
3.7.3.4.12	220kV Metering	1	Lot		
3.7.3.4.13	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
Sub Total 3.7					
3.8	Grounding System				
3.8.1	Stranded Bare Copper 240 Sq. mm** Grid (Including Fusion and Mechanical Connectors)	0	0		
3.8.2	Grounding Rods	0	0		
3.8.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	0	0		
3.8.4	Embedded Grounding System - Control Room	0	0		
3.8.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	0	0		
Sub Total 3.8					
3.9	Lightning Protection System				
3.9.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
3.9.2	Lightening Mast for equipment Protection	1	Lot		
3.9.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.9					
2.10	Firefighting System				
3.10.1	Fire protection/detection for 3 (three) auto transformers	1	Lot		
3.10.2	Fire protection/detection for 400kV GIS Building	1	Lot		
3.10.3	Fire protection/detection for Control House	1	Lot		
3.10.4	Fire protection/detection system for pump house building	1	Lot		
3.10.5	Fire protection/detection system for generator diesel tank	1	Lot		
3.10.6	Portable fire extinguishers	1	Lot		
3.10.7	Clean-agent fire extinguishers	1	Lot		
3.10.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.10					
3.11	HVAC And Ventilation Systems				
3.11.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
3.11.2	Control House HVAC and Ventilation Systems	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		<i>1</i>	<i>2</i>	<i>3</i>	<i>(1) x (3)</i>
Sub Total 3.11					
3.12	Accessories and Ancillary Material				
3.12.1	Junction and marshalling boxes, outdoor	1	Lot		
3.12.2	Junction and marshalling boxes, indoor	1	Lot		
3.12.3	Outdoor lighting, including lighting fixtures	1	Lot		
3.12.4	Indoor lighting, including lighting fixtures	1	Lot		
3.12.5	Control Cabinet for outdoor lighting	1	Lot		
3.12.6	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
3.12.7	Electric Overhead Travelling Crane for installation and removal of GIS Equipment	1	Lot		
3.12.8	Visual Monitoring System	1	Lot		
3.12.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.12					
3.13	Mandatory Maintenance, Repair tools and Testing Instruments				
3.13.1	GIS Equipment				
3.13.1.1	400kV GIS SF6 leakage detector, analyzer and processing unit all complete	1	Lot		
3.13.1.2	400kV GIS Wrenches and tools	1	Lot		
3.13.1.3	400kV GIS Pressure gauge	1	Nos		
3.13.1.4	400kV GIS Gas sampling and moisture meter	1	Nos		
3.13.1.5	400kV GIS Micro-Ohmmeter	1	Nos		
3.13.1.6	400kV GIS Circuit-breaker, timing tester	1	Nos		
3.13.1.7	400kV GIS Laptop computer with Specialized software for GIS setting and monitoring	1	Nos		
3.13.1.8	Complete set of SF6 gas service cart mounted on a trailer for mobile application. SF6 gas refilling cart equipped with 1 SF6 gas cylinder and the necessary instruments and adapters for easy and quick gas refilling in case of losses	1	Lot		
3.13.1.9	HV Test Bushing for GIS	1	Lot		
3.13.1.10	Online Partial Discharge Monitor System	1	Nos		
3.13.2	Auto Transformer				
3.13.2.1	Oil-treatment unit 6000lph along with suitable size and quantity of connection arrangement (MCCB (240-300 Amp), terminal lugs etc.) all complete (autotransformer)	1	Nos		
3.13.2.2	Oil dielectric tester	1	Nos		
3.13.2.3	Dielectric tester based on tan δ and dielectric losses , 10 kV	1	Nos		
3.13.2.4	Megger, electronic, 5 kV	1	Nos		
3.13.2.5	Wrenches and tools	1	Lot		
3.13.3	Complete set of Control and Protection panels for Substation				
3.13.3.1	Relay Test Kit	1	Lot		
3.13.3.2	Test Equipment & tools for SAS SYSTEM for measuring, configuration & diagnostics.	1	Lot		
Sub Total 3.13					
3.14	Mandatory Spare Parts				
3.14.1	HV Equipment				
3.14.1.1	Unit of 400kV surge arrester, complete with grading ring, terminals and surge counter	1	Lot		
3.14.1.2	Capacitive voltage transformer, 400kV	1	Nos		
3.14.1.3	Current transformer, 400kV	1	Nos		
3.14.1.4	Current transformer, 220kV	1	Nos		
3.14.1.5	Current transformer, 72.5kV	1	Nos		
3.14.2	Auto Transformer				
3.14.2.1	Complete set of gaskets with grease, for cover, manholes, hand holes, and pipping fittings.	1	Lot		
3.14.2.2	Lot of LV control and protective components, minimum one unit of each type of components used	1	Lot		
3.14.2.3	Pressure relief device, complete with accessories	1	Lot		
3.14.2.4	Bushings, one complete unit of each type used, with accessories	1	Lot		
3.14.2.5	Current transformer, one unit of each type	1	Nos		
3.14.2.6	Oil-circulating pump with motor, complete with accessories	1	Lot		
3.14.2.7	Cooling fan, complete with motor	1	Lot		
3.14.2.8	Buchholz relay, complete	1	Nos		
3.14.2.9	One instrument of each type used (temperature, oil level, pressure vent, etc.)	1	Lot		
3.14.2.10	One valve of each type used	1	Lot		
3.14.2.11	Insulating oil, 5% of the volume used	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.14.2.12	Silica gel, quantity for one load	1	Lot		
3.14.2.13	Tap changer diverter switch, spare contacts and transition resistance	1	Nos		
3.14.2.14	Tap changer selector switch spare contacts	1	Lot		
3.14.2.15	Rolls of Kraft insulating paper	1	Nos		
3.14.2.16	LA with accessories for HV,IV and LV side	1	Lot		
3.14.2.17	Additional spare parts as per Chapter 3: Auto Transformer Specification of Part 2: Employer's Requirements, Section V – B1 (Technical Specifications).	1	Lot		
3.14.3	630kVA Transformer				
3.14.3.1	All Bushing with metal parts (each voltage rating) for 630 KVA Transformer	1	Lot		
3.14.3.2	Oil Temperature Indicator with sensing device	1	Lot		
3.14.3.3	Tap Changer Contacts	1	Lot		
3.14.3.4	Buchholz Relay	1	Nos		
3.14.3.5	Explosion vent diaphragm	1	Nos		
3.14.3.6	Set of valve (each type)	1	Lot		
3.14.3.7	3-Phase 33 kV Horn Gap Fuse	1	Lot		
3.14.3.8	LA with accessories for both sides	1	Lot		
3.14.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.14					
3.15	Spare Parts for AC and DC Station Supply				
3.15.1	Spare for LV Switchgear				
3.15.1.1	LV circuit breaker, complete, with CT's and protection devices	1	Nos		
3.15.1.2	Outgoing thermomagnetic breakers - one unit of each type used	2	Nos		
3.15.1.3	Metering - one instrument of each type used	1	Nos		
3.15.1.4	Protection (other than included in LV breaker) One unit of each type used	1	Nos		
3.15.1.5	Automatic Transfer Switch One complete controller including sensors	1	Nos		
3.15.1.6	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.	1	Nos		
3.15.2	Spare for DC Distribution Panels				
3.15.2.1	Thermomagnetic breakers one unit of each type used	1	Nos		
3.15.2.2	Metering - one metering instrument of each type used	1	Nos		
3.15.2.3	Protection (other than included in LV breaker) One unit of each type used	1	Nos		
3.15.2.4	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.	1	Nos		
3.15.3	Spare for Diesel Generator Set				
3.15.3.1	Replaceable elements for air filter	1	Nos		
3.15.3.2	Replaceable elements for oil filter	1	Nos		
3.15.3.3	Replaceable elements for fuel filter	1	Nos		
3.15.3.4	Complete set of injectors	1	Nos		
3.15.3.5	Fuel injector pump	1	Nos		
3.15.3.6	Oil pump	1	Nos		
3.15.3.7	Intake valves	1	Nos		
3.15.3.8	Seats for intake valves	1	Nos		
3.15.3.9	Exhaust valves	1	Nos		
3.15.3.10	Set for exhaust valves	1	Nos		
3.15.3.11	Disconnect switch, with grounding blades, 245 kV, 3 Ø	1	Nos		
3.15.3.12	Set of pistons	1	Nos		
3.15.3.13	Set of complete bearings of the engine	1	Nos		
3.15.3.14	Set of all gaskets needed for the engine	1	Nos		
3.15.3.15	Set of thermostats	1	Nos		
3.15.3.16	Set of bearings for the alternator	1	Nos		
3.15.3.17	Set of control cards, at least one unit of each type used	1	Nos		
3.15.3.18	Diodes and thyristors of each type used	3	Nos		
3.15.3.19	Lamp, one unit of each type used	10	Nos		
3.15.3.20	Auxiliary relay, one unit of each type used	1	Nos		
3.15.3.21	Multifunction metering instrument	1	Nos		
3.15.3.22	Voltage and speed regulator component and actuator	1	Nos		
3.15.3.23	Controller components	1	Nos		
3.15.3.24	Instrument, detectors	1	Nos		
3.15.4	Spare for Batteries				
3.15.4.1	One unit of battery used in 220 V DC system	1	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.15.4.2	Loose parts for 220 V DC - connection elements, cables, links, etc.	1	Nos		
3.15.4.3	One unit of battery used in 48 Vdc system	1	Nos		
3.15.4.4	Loose parts for 48 V DC - connection elements, cables, links, etc.	1	Nos		
3.15.5	<u>Spare for Battery Chargers</u>				
3.15.5.1	Complete bridge of thyristors assembled on a cooling base	1	Nos		
3.15.5.2	Controller, complete including each type of card used	1	Nos		
3.15.5.3	Loose elements - auxiliary relays, breakers, metering instruments, control switches, fuses, etc.	1	Nos		
3.15.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.15					
3.16	<u>Mandatory spare parts - Miscellaneous material</u>				
3.16.1	Junction and marshalling boxed, outdoor, one of each type used	1	Nos		
3.16.2	Junction and marshalling boxed, indoor, one of each type used	1	Nos		
3.16.3	Outdoor lighting fixture, one unit of each type used	1	Nos		
3.16.4	Post-type insulator, one unit of each type used	1	Nos		
3.16.5	Suspension insulator, 5% of the total used	1	Nos		
3.16.6	Bus bar (rigid and strain) hardware, including, connectors, terminals, separator, corona rings, 5% of each type used, minimum one unit	1	Nos		
3.16.7	Grounding conductors, 5% of the installed conductors (stranded copper conductor, rectangular-shape copper bar and grounding rod)	1	Nos		
3.16.8	Fusion connection material, including molds, welding powder and installation tools, quantity required to make 5% of the total executed connections	1	Nos		
3.16.9	Mechanical connectors for grounding, 5% of the total executed connections	1	Nos		
3.16.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.16					
3.17	<u>Mandatory spare parts for 400kV GIS</u>				
3.17.1	<u>Spare Gas</u>				
3.17.1.1	SF6 bottles required to fill the two largest volume compartments	1	Lot		
3.17.2	<u>Circuit Breakers, 4000 A, 50kA</u>				
3.17.2.1	Circuit breaker, complete pole assembly	1	Lot		
3.17.2.2	Complete sets of main contacts	1	Lot		
3.17.2.3	Complete sets of arcing contacts	2	Lot		
3.17.2.4	Operating mechanism, complete	1	Lot		
3.17.2.5	Closing coils	4	Lot		
3.17.2.6	Tripping coils	4	Lot		
3.17.3	<u>Disconnect-Switches, 4000 A</u>				
3.17.3.1	Disconnect-Switch, complete pole	1	Nos		
3.17.3.2	Complete set of contacts	2	Nos		
3.17.3.3	Operating mechanism, complete	1	Nos		
3.17.3.4	Operating mechanism motor	2	Nos		
3.17.4	<u>Maintenance Earthing Switches</u>				
3.17.4.1	Earthing-Switch, complete pole	1	Nos		
3.17.4.2	Complete set of contacts	2	Nos		
3.17.4.3	Operating mechanism, complete	1	Nos		
3.17.4.4	Operating mechanism motor	2	Nos		
3.17.5	<u>High-speed earthing Switches</u>				
3.17.5.1	High-speed earthing switch, complete pole	1	Nos		
3.17.5.2	Complete set of contacts	2	Nos		
3.17.5.3	Operating mechanism, complete	1	Nos		
3.17.5.4	Operating mechanism motor	2	Nos		
3.17.6	<u>Other Equipment</u>				
3.17.6.1	Voltage transformer, 400 kV, complete with disconnecting and earthing switch	3	Nos		
3.17.6.2	Current transformer, metering core, loose part	6	Nos		
3.17.6.3	Current transformer, protection core, loose part	6	Nos		
3.17.7	<u>400kV GIS Bay, Local Control Cabinet</u>				
3.17.7.1	One Bay Local Control Cabinet complete, wired, with all specified devices	1	Lot		
3.17.8	<u>Bus Bar Elements</u>				
3.17.8.1	Bus conductor elements	1	Lot		
3.17.8.2	Bus connection elements	1	Lot		
3.17.8.3	GIS insulators, one of each type used	1	Lot		
3.17.8.4	Pressure relief elements	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
		1	2	3	(1) x (3)
3.17.9	SF6-to-Air Bushing Modules				
3.17.9.1	SF6-to-air bushing module, 400 kV, single phase	1	Lot		
3.17.10	Loose Spare Parts				
3.17.10.1	5% of auxiliary relays, control devices, fuses, terminal blocks, etc. minimum one unit of each type used	1	Lot		
3.17.11	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.17					
3.18	Spare of LV control and power cables				
3.18.1	LV control cable, 5% of the installed cables	1	Lot		
3.18.2	LV power cable, 5% of the installed cables	1	Lot		
3.18.3	Cable installation accessories - 5% of the installed material	1	Lot		
3.18.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.18					
3.19	Spare parts of Mechanical Equipment				
3.19.1	Fire protection				
3.19.1.1	Fire protection/detection for auto transformer - one unit of each type used	1	Lot		
3.19.1.2	Clean-agent fire extinguisher	1	Lot		
3.19.1.3	Control Building general fire protection/detection system, one unit of each component used	1	Lot		
3.19.1.4	GIS Building general fire protection/detection system, one unit of each component used	1	Lot		
3.19.2	Control building HVAC system				
3.19.2.1	Throwaway air filters per air conditioning unit	1	Lot		
3.19.2.2	Pulley belts per air conditioning unit motor	1	Lot		
3.19.2.3	Thermostat per air conditioning unit	1	Lot		
3.19.3	GIS building ventilation system				
3.19.3.1	Throwaway air filters per ventilation system	1	Lot		
3.19.3.2	Pulley belts per ventilation unit motor	1	Lot		
3.19.3.3	Thermostat per ventilation unit	1	Lot		
3.19.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.19					
Total (Carried forward to Grand SC-5)					
Name of Bidder:					
Signature of Bidder:					
Note:					
***:This value is indicative, the Contractor will validate as per item 1.1.6 of Design Works (Electrical)					

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Breakdown of Rates and Prices Schedule No. 4. Installation and Other Services including all related Civil Works

Item No.	Description	Total
Option A (No Future)		
4.1	Design Works (Electrical)	
4.2	Breakdown of Earthworks (from Schedule No.4.2)	
4.3	Breakdown of Civil Works (from Schedule No.4.3)	
4.4	Other Installation Services (from Schedule No.4.5)	
4.5	Total Excluding Summary of Breakdown of Day works (from Schedule 4.4) (Carried forward to Grand SC-5)	
4.6	Summary of Breakdown of Day works (from Schedule 4.4) (Carried forward to Grand SC-5)	
4.7	Total Including Breakdown of Day works.	
		Name of the Bidder:
		Signature of Bidder:

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Schedule No. 4.1: Breakdown of General Installation and Construction Items

Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
		1	2	US\$	(1)x(3)
4.1.1	Design Works (Electrical)				
4.1.1.1	Indoor and outdoor storage facilities for storing equipment and material in substation	1	Lot		
4.1.1.2	Site Office, Accommodation and vehicular arrangement as Specified in PSR	1	Lot		
4.1.1.3	Operation and Maintenance Manuals and Procedures	1	Lot		
4.1.1.4	"As-Built" Drawings for All Works including civil, building mechanical etc.	1	Lot		
4.1.1.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.1					
4.1.2	AIS HV and MV Equipment Installation				
4.1.2.1	Auto-Transformer, 315 MVA, 400/220/33 kV, Three Phase, OLTC, RTCC facility, necessary arrangement for surge protection on both sides including tertiary, all fittings & accessories as specified/ required for completion of the scope of works as per technical specification	3	Nos		
4.1.2.2	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	6	Nos		
4.1.2.3	Current Transformer (CT), 400kV, Single Phase, Tank Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	12	Nos		
4.1.2.4	Current Transformer (CT), 220kV Single Phase, Tank Type, 5 Core, 1600A, 120% Extended Current Rating	9	Nos		
4.1.2.5	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
4.1.2.6	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	12	Nos		
4.1.2.7	220kV Surge Arrester (SA), Zinc Oxide 216kV Rated Voltage, 10kA, 12kJ/kV	9	Nos		
4.1.2.8	Substation Service Transformer, 630 kVA, 33/0.4kV	2	Nos		
4.1.2.9	30kV,10kA Lightning arrester for 33kV line bays with support structure, earthing arrangement all complete	6	Nos		
4.1.2.10	30kV,10kA Lightning arrester for 33/0.4kV station service transformers with support structure, earthing arrangement all complete	6	Nos		
4.1.2.11	Tandom Isolator without Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)	9	Nos		
4.1.2.12	Isolator with One Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)	3	Nos		
4.1.2.13	Isolator with Two Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)	3	Nos		
4.1.2.14	72.5kV Double Break Isolator, Single Phase	1	Nos		
4.1.2.15	220kV Circuit Breaker, Three Phase, 1600A	3	Nos		
4.1.2.16	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
4.1.2.17	72.5kV Current Transformer	6	Nos.		
4.1.2.18	400kV Bus Support Post Insulator	1	Lot		
4.1.2.19	220kV Bus Support Post Insulator	1	Lot		
4.1.2.20	72.5kV Bus Support Post Insulator	1	Lot		
4.1.2.21	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
4.1.2.22	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.2					
4.1.3	Hot Dip Galvanized Steel				
4.1.3.1	Gantry Column for 400 kV Incoming Line	6	Nos		
4.1.3.2	Gantry Column for 220 kV Incoming Line	5	Nos		
4.1.3.3	Gantry Girder for 400 kV Incoming Line	4	Nos		
4.1.3.4	Gantry Girder for 220 kV Incoming Line	3	Nos		
4.1.3.5	Support Structure for 400 kV Current Transformer	12	Nos		
4.1.3.6	Support Structure for 400 kV Capacitive Voltage Transformer	12	Nos		
4.1.3.7	Support Structure for 400 kV Surge Arrester	12	Nos		
4.1.3.8	Support Structure for 400 kV Bus Support	1	Lot		
4.1.3.9	Support Structure for 220 kV Current Transformer	9	Nos		
4.1.3.10	Support Structure for 220 kV Surge Arrester	9	Nos		

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Schedule No. 4.1: Breakdown of General Installation and Construction Items

Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
		1	2	3	(1)x(3)
4.1.3.11	Support Structure for 220 kV Bus Support	1	Lot		
4.1.3.12	Tandom Isolator without Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)	1	Lot		
4.1.3.13	Isolator with One Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)	9	Nos		
4.1.3.14	Isolator with Two Earthing Switch, 220kV,1600 A, 50kA, Three Phase (Set of 3)	9	Nos		
4.1.3.15	Support Structure for 72.5 kV Disconnecting Switch	1	Lot		
4.1.3.16	Support Structure for 72.5 kV Current Transformer	6	Nos		
4.1.3.17	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
4.1.3.18	Support Structure for 72.5 kV Single Switch Stand	1	Lot		
4.1.3.19	Support Structure for 30kV Lightning Arrester	15	Nos.		
4.1.3.20	Structures for Lightning Mast and other Lighting structures	1	Lot		
4.1.3.21	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.3					
4.1.4	Bus Bar and Overhead Connections Installation				
4.1.4.1	5" AL Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
4.1.4.2	4" AL Tubular Bus Bar 114.2mm Outer Diameter, 8.51mm Thickness	1	Lot		
4.1.4.3	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		
4.1.4.4	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		
4.1.4.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.4					
4.1.5	LV Control and Power Cable Installation				
4.1.5.1	LV Control Cables	1	Lot		
4.1.5.2	LV Power Cables	1	Lot		
4.1.5.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		
4.1.5.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		
4.1.5.5	33 kV Cable Pothead	1	Lot		
4.1.5.6	Power Cable for Filter Plant (Transformer) 3.5CX240 sqmm (Armoured, PVC Insulated) with suitable termination arrangement all complete	1	Lot		
4.1.5.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
4.1.5.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.5					
4.1.6	AC and DC Station Supply Installation				
4.1.6.1	400 V AC Main Switch Board				
4.1.6.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
4.1.6.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
4.1.6.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
4.1.6.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
4.1.6.2	400 V AC Main Lighting Board				
4.1.6.2.1	100KVA Lighting Transformer	2	Nos		
4.1.6.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
4.1.6.3	400 V AC Emergency Lighting Distribution Board				
4.1.6.3.1	100KVA Lighting Transformer	1	Nos		

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
		1	2	US\$	(1)x(3)
4.1.6.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker	1	Nos		
4.1.6.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers	1	Nos		
4.1.6.4	400 V AC Distribution Board				
4.1.6.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
4.1.6.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
4.1.6.4.3	400/1A Current Transformer, Class 5P20	1			
4.1.6.4.4	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		
4.1.6.4.5	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
4.1.6.5	400 V AC AMF Panel				
4.1.6.5.1	400/1A Current Transformer, Class 1	3	Nos		
4.1.6.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
4.1.6.6	DC Chargers and Batteries				
4.1.6.6.1	220V Battery Charger (Float/Boost)	3	Nos		
4.1.6.6.2	48V Battery charger (Float/Boost)	3	Nos		
4.1.6.6.3	250A Throw over Switch, Interlock	6	Nos		
4.1.6.6.4	Battery, 220Vdc, 108 Minimum Cells	2	Nos		
4.1.6.6.5	Battery, 48Vdc, 24 Minimum Cells	2	Nos		
4.1.6.7	DC Distribution Boards				
4.1.6.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
4.1.6.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
4.1.6.7.3	DC Fuse Box, 220Vdc	1	Lot		
4.1.6.7.4	DC Fuse Box, 48Vdc	1	Lot		
4.1.6.8	Other Equipment				
4.1.6.8.1	Diesel Generator Set, 250kVA (Including Full Tank)	1	Nos		
4.1.6.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.6					
4.1.7	AC and DC Station Supply Installation				
4.1.7.1	Line/feeder Bay				
4.1.7.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	10	Nos		
4.1.7.1.2	Current Transformer Modules, three cores, 400kV, single- phase, Three-phase set	20	Nos		
4.1.7.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	20	Nos		
4.1.7.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	20	Nos		
4.1.7.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set	10	Nos		
4.1.7.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set	10	Nos		
4.1.7.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	10	Nos		
4.1.7.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	10	Nos		
4.1.7.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	10	Nos		
4.1.7.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	10	Nos		
4.1.7.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
		1	2	3	(1)x(3)
4.1.7.1.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Line/Feeder Bay Lot	10	Bays		
4.1.7.2	Transformer Bay				
4.1.7.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
4.1.7.2.4	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	8	Nos		
4.1.7.2.5	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	8	Nos		
4.1.7.2.6	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	8	Nos		
4.1.7.2.7	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	4	Nos		
4.1.7.2.8	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set	4	Nos		
4.1.7.2.9	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	4	Nos		
4.1.7.2.10	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set	4	Nos		
4.1.7.2.11	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
4.1.7.2.12	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
4.1.7.2.13	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.2.14	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.2.15	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.2.17	Gas Insulated bus (GIB) and required supports for GIB run whole for Transformer Bay Lot	4	Bays		
4.1.7.3	Diameter Middle Breaker Bay				
4.1.7.3.1	SF6 Circuit breaker				
a.	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	3	Nos		
b.	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
4.1.7.3.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	14	Nos		
4.1.7.3.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	14	Nos		
4.1.7.3.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	14	Nos		
4.1.7.3.5	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	7	Nos		
4.1.7.3.6	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	7	Nos		
4.1.7.3.7	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.3.8	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.3.9	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.4	Gas Insulated BUSBAR				
4.1.7.4.1	400kV , 3 single phase (isolated), SF6 gas insulated , metal enclosed 4000A bus bars each enclosed in three individual bus enclosures	7	Diameter		
4.1.7.4.2	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set	2	Nos		
4.1.7.4.3	High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	2	Nos		
4.1.7.4.4	Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set	2	Nos		

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
		1	2	US\$	(1)x(3)
4.1.7.4.5	Bus Bar Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	2	Nos		
4.1.7.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.7					
4.1.8	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.				
4.1.8.1	Installation of Control and Protection panels for 400 kV station as specified in Scope and Employers Requirements including but not limited to:				
4.1.8.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	21	Nos		
4.1.8.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)	8	Nos		
4.1.8.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	6	Nos		
4.1.8.1.4	400kV (Double Bus Bar Protection)	2	Set		
4.1.8.1.5	Stub Bus Differential Protection for Future Bay	6	Bays		
4.1.8.1.6	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.8.2	Complete set of Control and Protection panels for 220 kV station as specified in Scope and Employers Requirements including but not limited to:				
4.1.8.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	4	Nos		
4.1.8.2.2	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	6	Nos		
4.1.8.2.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.8.3	Installation of Control and Protection panels for 33 kV station as specified in Scope and Employers Requirements including but not limited to:				
4.1.8.3.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
4.1.8.3.2	Transformer Protection Panel	2	Nos		
4.1.8.3.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.8.4	Installation of Substation Automation & Metering				
4.1.8.4.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
4.1.8.4.2	Substation Automation System (SAS) for 400 kV System per diameter	7	Set		
4.1.8.4.3	Integration/connection of proposed 3 nos of 220 kV ICT bays with existing 220kV SAS system.	1	Lot		
4.1.8.4.4	Substation Automation System (SAS) for 33kV System per feeder	2	Set		
4.1.8.4.5	Substation Automation System (SAS) for Auxiliary System	1	Set		
4.1.8.4.6	Integration of all 400kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
4.1.8.4.7	Telecommunication system for New Butwal	1	Lot		
4.1.8.4.8	Fibre Optic SDH System	1	Lot		
4.1.8.4.9	Phone System	1	Lot		
4.1.8.4.10	Line traps (4 required), complete with hardware and supporting material, and the power line carrier equipment, complete with necessary coupling equipment and cables for 2 sets of PLCC system complete.	1	Lot		
4.1.8.4.11	400 kV Metering	1	Lot		
4.1.8.4.12	220kV Metering	1	Lot		
4.1.8.4.13	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
Sub Total 4.1.8					
4.1.9	Grounding System				
4.1.9.1	Stranded Bare Copper 240 Sq. mm Grid (Including Fusion and Mechanical Connectors)	1	Lot		
4.1.9.2	Grounding Rods	1	Lot		

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
		1	2	3	(1)x(3)
4.1.9.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
4.1.9.4	Embedded Grounding System - Control room	1	Lot		
4.1.9.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.9					
4.1.10	Lightning Protection System				
4.1.10.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
4.1.10.2	Lightening Mast for Protection	1	Lot		
4.1.10.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.10					
4.1.11	Firefighting System				
4.1.11.1	Fire protection/detection for 3 (three) auto transformers	1	Lot		
4.1.11.2	Fire protection/detection for 400kV GIS Building	1	Lot		
4.1.11.3	Fire protection/detection for Control House	1	Lot		
4.1.11.4	Fire protection/detection system for pump house building	1	Lot		
4.1.11.5	Fire protection/detection system for generator diesel tank	1	Lot		
4.1.11.6	Portable fire extinguishers	1	Lot		
4.1.11.7	Clean-agent fire extinguishers	1	Lot		
4.1.11.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.11					
4.1.12	HVAC and Ventilation Systems				
4.1.12.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
4.1.12.2	Control House HVAC and Ventilation Systems	1	Lot		
Sub-Total 4.1.12					
4.1.13	Accessories and Ancillary Material				
4.1.13.1	Junction and marshalling boxes, outdoor	1	Lot		
4.1.13.2	Junction and marshalling boxes, indoor	1	Lot		
4.1.13.3	Outdoor lighting, including lighting fixtures	1	Lot		
4.1.13.4	Indoor lighting, including lighting fixtures	1	Lot		
4.1.13.5	Control Cabinet for outdoor lighting	1	Lot		
4.1.13.6	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
4.1.13.7	Electric Overhead Travelling Crane for installation and removal of GIS Equipment	1	Lot		
4.1.13.8	Visual Monitoring System	1	Lot		
4.1.13.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.13					
Total(Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Schedule No. 4.2 : Breakdown of Earthworks

Item no.	Description	Qty	Unit	Unit Rate in US\$	Amount in US\$
4.2.1	Site Clearing, Including Removal of Trees and Stumps	1	Lot		
4.2.2	Design Works (Electrical)	1	Lot		
4.2.3	General Excavation	1	Lot		
4.2.4	Compacted Back Fill	1	Lot		
4.2.5	Uncompact Back Fill	1	Lot		
4.2.6	Surplus Disposal	1	Lot		
4.2.7	Surface Works, Including Compaction/Consolidation	1	Lot		
4.2.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Total (Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Schedule No. 4.3 : Breakdown of Civil Works

Item no.	Description	Qty	Unit	Unit Rate in US\$	Amount in US\$
		2	3	(1)x(3)	
4.3.1	Design Works (Electrical)				
4.3.1.1	Foundations of 400 kV Gantries	6	Nos		
4.3.1.2	Foundations of 220 kV Gantries	5	Nos		
4.3.1.3	Foundations of 400 kV Capacitor Voltage Transformers & Tank Type Current Transformers	12	Nos		
4.3.1.4	Foundation of 400 kV Surge Arrestor	12	Nos		
4.3.1.5	Foundations of 400 kV Post Type Insulator Bus Support	1	Lot		
4.3.1.6	Foundation, Oil Containment, and Sump Pit For 400/220kV 315 MVA Three Phase Autotransformer	3	Nos		
4.3.1.7	Autotransformer 22kg/m Railway System (22kg/m Steel Rails, Rail Ties, Elastomeric Pad, Screws, Baseplate, and Rail Clamps)	3	Nos		
4.3.1.8	Firewalls Between Auto Transformers	4	Nos		
4.3.1.9	Foundation for 400kV GIB Bus Runs to AIS Equipment	1	Lot		
4.3.1.10	Foundation of 220kV Current Transformer (CT)	9	Nos		
4.3.1.11	Foundation of 220kV Circuit Breaker	3	Nos		
4.3.1.12	Foundation of 220kV Surge Arrestor	9	Nos		
4.3.1.13	Foundation of 220kV Post Type Insulator Bus Support	1	Lot		
4.3.1.14	Foundation of 220kV Disconnecting Switch	1	Lot		
4.3.1.15	Foundation of 220kV Isolator with Earthing Switch	1	Lot		
4.3.1.16	Foundation of 72.5kV Post Type Insulator Bus Support	1	Lot		
4.3.1.17	Foundation of Station Service Transformer	2	Nos		
4.3.1.18	Foundation of 72.5kV Circuit Breaker	2	Nos		
4.3.1.19	Foundation of 72.5kV Current Transformer	6	Nos		
4.3.1.20	Foundation of 72.5kV Disconnecting Switch	1	Lot		
4.3.1.21	Foundation of 33kV Single Phase Switches	1	Lot		
4.3.1.22	Foundation of Diesel Generator Set & Fuel Tank	1	Nos		
4.3.1.23	Foundation of 30kV,10kA Lightning arrester for line bays	6	Nos		
4.3.1.24	Foundations of 30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
4.3.1.25	Foundation for Lightning Mast as required for total protection of equipment	1	Lot		
4.3.1.26	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.1					
4.3.2	External Works and Landscaping				
4.3.2.1	Internal Paving	1	Lot		
4.3.2.2	Landscaping, Including Maintenance up to Taking Over	1	Lot		
4.3.2.3	Construction of reinforced concrete trenches/duct banks with manholes for all types of HV/MV power and control cables between switchgear building, substation control building and Autotransformer and all substation equipment as specified in Scope and Employers Requirements.	1	Lot		
4.3.2.4	Anti-weed treatment & stone spreading along with cement concrete layer, Internal drainage system, external drainage system and Sewage handling as defined in the technical specifications.	1	Lot		
4.3.2.5	Superficial storm drainage system to drain water outside substation during heavy rainfall	1	Lot		
4.3.2.6	Parking Areas	1	Lot		
4.3.2.7	Guard House	1	Lot		
4.3.2.8	Substation Perimeter Fence	1	Lot		
4.3.2.9	Rain Water Harvesting as per the Employer's requirements.	1	Lot		
4.3.2.10	Firefighting Pump House and Water Tank	1	Lot		
4.3.2.11	Security Lighting along the Fence and Inside the Perimeter	1	Lot		
4.3.2.12	Retaining wall and River Protection work	1	Lot		
4.3.2.13	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.2					
4.3.3	General				
4.3.3.1	Mobilization & Demobilization, Site Infrastructure, Temporary Works at site related to site activities.	1	Lot		
4.3.3.2	Final Cleanup (Including Removal of Excess Materials and Temporary Works) Demobilization	1	Lot		
4.3.3.3	Supply and Installation of Water Supply System as per the Employer's requirements.				
4.3.3.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.3					
4.3.4	Substation Buildings				
4.3.4.1	Substation Control Building	1	Lot		
4.3.4.2	400kV GIS Building	1	Lot		
4.3.4.3	Switchyard Panel Room (SPR) of 30 Sq.m for 220 kV bays as per the Employer's requirements.	1	Lot		
4.3.4.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.4					
Total (Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Summary of Breakdown for Schedule 4.4 Day works	
Description	Amount in US\$
1. Sub-Total for Day work: Labor (4.4.1)	
2. Sub-Total for Day work: Materials (4.4.2)	Design Works (Electrical)
3. Sub-Total for Day work: Contractor's Equipment (4.4.3)	
TOTAL (to be carried forward to Schedule 4.0)	
Name of Bidder:	
Signature of Bidder:	

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Schedule No. 4.4.1 : Breakdown of Day work Rates: Labor					
Item no.	Description	Qty	Unit	Unit Rate in US\$	Amount in US\$
4.4.1	Supervision and Labor				
4.4.1.1	Design Works (Electrical)	350	h		
4.4.1.2	Foreman	400	h		
4.4.1.3	Surveyor	150	h		
4.4.1.4	Technician	600	h		
4.4.1.5	Skilled laborer	600	h		
4.4.1.6	Semiskilled laborer	600	h		
4.4.1.7	Unskilled laborer	600	h		
4.4.1.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		specify		
Total(Carried forward to SC-4.4)					
Name of Bidder:					
Signature of Bidder:					
Note:					
<i>Note: The labor rate should include all cost needed to provide the Labor at required place including all related cost for providing the labour, ensuring that the labor is qualified for his/her job and can perform the required task professionally.</i>					

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Schedule No. 4.4.2 : Breakdown of Day work Rates: Materials					
Item no.	Description	Qty	Unit	Unit Rate in US\$	Amount in US\$
4.4.2.1	Concrete Work				
4.4.2.1.1	Design Works (Electrical)	50	m3		
4.4.2.1.2	Concrete to foundation	150	m3		
4.4.2.1.3	Concrete to superstructure	200	m3		
4.4.2.2	Steel Reinforcement				
4.4.2.2.1	Mild Steel reinforcement, including cutting, bending	10	t		
4.4.2.2.2	High tensile steel reinforcement, including cutting, bending	25	t		
4.4.2.3	Structural Steel				
4.4.2.3.1	Commercial sections, including cutting, welding, bolting	10	t		
4.4.2.4	Excavation Work				
4.4.2.4.1	Excavation in rock (type R), including shoring, backfill, haul and disposal	200	m3		
4.4.2.4.2	Ditto, in soil (type MB and LB)	400	m3		
4.4.2.4.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)				
4.4.2.4.6	Price for Control Point on Wave Switching Device (CPWSD) to be installed on 400kV Breaker supplied as per Schedule-2	1	Nos		
4.4.2.4.7	Price for Pre-Insertion Resistor (PIR) to be installed on 400kV Breaker supplied as per schedule-2	1	Nos		
4.4.2.4.8	Price for Stub-Bus Differential Protection for 400kV Future Bay	1	Nos		
Total(Carried forward to SC-4.4)					
Name of Bidder:					
Signature of Bidder:					
<p><i>Note: Quoted Unit Price shall include all the cost required to perform task successfully such as loading, transportation, insurance, unloading, cutting (if required), placing as per intended required task, while insuring the quality of the material and health and safety, storing at proper storage place with security and carrying out works as per Employer's requirement and Conditions of Contract.</i></p>					

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Schedule No. 4.4.3 : Breakdown of Day work Rates: Contractor's Equipment					
Item no.	Description	Nominal quantity (hours)	Unit	Basic hourly rental rate	Amount
4.4.3	Contractors' Equipment				
4.4.3.1	Design Works (Electrical)	20	h		
4.4.3.2	Concrete Mixer, above to 5 m3/h	20	h		
4.4.3.3	Concrete Pump (Self-Propelled) up to 20 m3/h	40	h		
4.4.3.4	Concrete Pump (Self-Propelled) above to 20 m3/h	40	h		
4.4.3.5	Concrete batch plant, up to 20 m3/h	20	h		
4.4.3.6	Concrete batch plant, above 20 m3/h	20	h		
4.4.3.7	Transit mixer, up to 5 m3	40	h		
4.4.3.8	Transit mixer, above to 5 m3	40	h		
4.4.3.9	Bulldozer, with ripper, up to CAT D8 class	50	h		
4.4.3.10	Bulldozer, with ripper, above to CAT D8 class	50	h		
4.4.3.11	Track loader, up CAT 953 class	30	h		
4.4.3.12	Track loader, above CAT 953 class	50	h		
4.4.3.13	Wheel loader, up to CAT 930 class	50	h		
4.4.3.14	Wheel loader, above CAT 930 class	50	h		
4.4.3.15	Track excavator	100	h		
4.4.3.16	Air Compressor	100	h		
4.4.3.17	Mobile crane, up to 10 t	50	h		
4.4.3.18	Mobile crane, above 10 t, up to 20 t	50	h		
4.4.3.19	Mobile crane, above 20 t	50	h		
4.4.3.20	Lorry, up to 10 t	100	h		
4.4.3.21	Lorry, above 10 t	100	h		
4.4.3.22	Tipper, up to 10 t	100	h		
4.4.3.23	Tipper, above 10 t	100	h		
4.4.3.24	Pick-up	200	h		
4.4.3.25	Diesel generator, up to 100 kW	100	h		
4.4.3.26	Diesel generator, above 100 kW, up to 250 kW	100	h		
4.4.3.27	Diesel generator, above 250 kW	100	h		
4.4.3.28	Welding Set, Including Welding Rods	300	h		
Total (Carried forward to SC-4.4)					
Name of Bidder:					
Signature of Bidder:					
Note:					
<i>The Basic Hourly rates includes all cost that require to run and perform the task, such as Equipment rental with operator, maintenance of vehicle, running responsibility, health and safety protection, petrol, diesel, lubricants, driver, assistance etc. required for carrying the task with the equipment.</i>					

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Schedule No. 4.5 : Other Installation Services						
Item no.	Description	Unit	Quantity	Unit Rate in US\$	Amount in US\$	
Sub Total 4.5.1						
4.5.1	Design Works (Electrical)					
4.5.1.1	General Mitigation Measures					
4.5.1.1.1	Develop a detailed Environmental, Social, Health, and Safety (ESHS) Management Plan for Contractor's employees.	1	Lot			
4.5.1.1.2	Develop, provide training and enforce a Worker Code of Conduct that includes an anti-sexual harassment policy	1	Lot			
4.5.1.1.3	Conduct Employee Induction Training on H&S and environmental/social/cultural sensitivity	1	Lot			
4.5.1.1.4	Implement Community Grievance Redress Plan	1	Lot			
4.5.1.1.5	Personal Protection equipment all complete (Safety Boots, Reflection Jackets, Safety Helmet, Safety Goggles, Safety Mask, Safety earplugs, Safety hand gloves etc.)	1	Lot			
Sub Total 4.5.1.1						
4.5.1.2	Physical Environment Mitigation Measures					
4.5.1.2.1	Implement an Erosion and Sediment Control Plan	1	Lot			
4.5.1.2.2	Manage excavated soils	1	Lot			
4.5.1.2.3	Spray disturbed areas with water if substantive off-site fugitive dust impacts occur	1	Lot			
4.5.1.2.4	Provide a pit toilet and bury all organic wastes at tower construction sites	1	Lot			
4.5.1.2.5	Install septic systems/package and proper wastewater disposal system for workers	1	Lot			
4.5.1.2.6	Provide hazardous material training to concerned staff	1	Lot			
4.5.1.2.7	Stockpile materials for use in controlling spills	1	Lot			
4.5.1.2.8	Provide secondary containment for any fuel or hazardous materials	1	Lot			
4.5.1.2.9	Collect and segregate all waste for reuse, recycle, or disposal	1	Lot			
4.5.1.2.10	Dispose of solid waste at approved waste disposal facilities	1	Lot			
Sub Total 4.5.1.2						
4.5.1.3	Socio-economic and Cultural Environment Mitigation Measures					
4.5.1.3.1	Implement Workforce Management Plan	1	Lot			
4.5.1.3.2	Implement Worker Access Management Protocol	1	Lot			
4.5.1.3.3	Implement Traffic Management Plan and maintain the damaged roads caused by contractors	1	Lot			
4.5.1.3.4	Develop and Implement Worker Grievance Redress Mechanism	1	Lot			
4.5.1.3.5	Conduct community training on EMF risks	1	Lot			
Sub Total 4.5.1.3						
4.5.1.4	Gender, Social Inclusion and Counter-TIP Measures					
4.5.1.4.1	Develop and implement Anti-Sexual Harassment Policy, provide orientation to the entire workers	Lot	1			
4.5.1.4.2	Conduct awareness raising and community meetings to encourage women, socially excluded, historically marginalized, vulnerable groups to apply for jobs	Lot	1			
4.5.1.4.3	Develop and Implement TIP Risk Management Plan	Lot	1			
4.5.1.4.4	Training to the Contractor's employees/staff on Gender and Social Inclusion, prevention on sexual harassment, gender-based violence, child labor and TIP	Lot	1			
4.5.1.4.5	Community TIP risk prevention sensitization and community consultation	Lot	1			
4.5.1.4.6	Community Grievance Redress Plan must have system of Anonymous reporting for TIP suspected cases	Lot	1			
Sub Total 4.5.1.4						
4.5.2	Testing And Commissioning					
4.5.2.1	Site Testing and Commissioning of HV AIS Equipment	1	Lot			
4.5.2.2	Site Testing and Commissioning of Power Autotransformers	1	Lot			
4.5.2.3	Site Testing and Commissioning of 400kV GIS Equipment	1	Lot			
4.5.2.4	Site Testing and Commissioning of Protection/Communication and Control (SCADA and SAS) Equipment	1	Lot			
4.5.2.5	Site Testing and Commissioning of Electrical Auxiliary Service Equipment and Power MV and LV Cables	1	Lot			
4.5.2.6	Site Testing and Commissioning of Mechanical Auxiliary Service Equipment	1	Lot			
4.5.2.7	One Month Commercial Operation after Commissioning	1	Lot			
4.5.2.8	End to End Test for all points as specified, including Control, Protection & Remote End Modification	1	Lot			
4.5.2.9	Closed loop test of equipment all complete	1	Lot			
4.5.2.10	P.Q (Power Quality), Revenue Energy meter and all remaining equipment of S/S	1	Lot			
4.5.2.11	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot			

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Schedule No. 4.5 : Other Installation Services					
Item no.	Description	Unit	Quantity	Unit Rate in US\$	Amount in US\$
					Sub Total 4.5.2
4.5.3	Training and O&M Assistance				
Training at Manufacturers Work					
4.5.3.1	Control & Protection, Substation Automation System and Com	1	Lot		
4.5.3.2	400 kV GIS Equipment and System (Circuit Breaker, Isolator, C	1	Lot		
Training at Site					
4.5.3.3	Control & Protection (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.4	Substation Automation System including the integration aspect of SCADA (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.5	For 400kV Indoor GIS and Outdoor Switchyard Equipment (CT, CVT, Isolator and Circuit Breaker) Operation and Maintenance. (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.6	Operation and maintenance of Transformers (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.7	AC/DC auxiliaries and mechanical system (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.8	Training at site for other systems (provide list)	1	Lot		
					Sub Total 4.5.3
Total(Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Price Schedule No. 5 : Grand Summary		
Item No	Description	Total Price in US\$
5.1	Total Schedule No. 1. Design Services	
5.2	Design Works (Electrical)	
5.3	Total Schedule No. 3. Plant, and Mandatory Spare Parts Supplied from within the Employer's Country	
5.4	Total Schedule No. 4. Installation and Other Services including all related Civil Works (Excluding Summary of Breakdown of Day works) (includes SC-4.1, SC-4.2, SC-4.3 and SC-4.5)	
5.5	TOTAL (to Bid Form - Resulting contract Price after correction if any)	
5.6	Output VAT (if applicable)	
5.7	Total including Output VAT (5.5+5.6)	
5.8	Total of Summary of Breakdown of Day works (to bid form) (from item No.4.6 of SC-4)	
5.9	Grand Total Including Day work for Evaluation and Comparison Purpose (5.5+5.8)	
Name of Bidder:		
Signature of Bidder:		
Note:		
<i>Quoted Unit Price shall include all the cost required to perform task successfully such as all resources required to carry out the Work, personnel, material, equipment, loading, transportation, insurance, unloading and storing at proper storage place and carrying out works as per Employer's requirement and Conditions of Contract.</i>		
<i>The purpose of price schedules is to identify the Bid Price which will be used to determine progress payment and the rates can be used to determine the price of any variation to scope . The Bid Price if accepted and included in the Contract shall become Contract Price and the Contract price shall not be adjusted (except as stated under Conditions of Contract under Sub-Clause 13.8) in case any quantity varies. The Price quoted under Price Schedule is as per provision of Employer's Requirements and Conditions of Contract.</i>		

Lot 3 Price Schedule

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Price Schedule

Breakdown of Rates and Prices Schedule No. 1. Design Services					
Item No	Description	Qty	Unit	Unit Rate	Total Price
		1		US\$	US\$
<i>(1) x (2)</i>					
1.1	Design Works (Electrical)				
Complete Electromechanical and Electrical Design of New Substation as Specified in Scope and Employers Requirements including but not limited to:					
1.1.1	Substation Design (SLD, Layout, Section elevation, P&C, SCADA, 400/220kV Switchgear, Auto Transformers along with connections, Auxiliary System, Control, LV & Fiber Optic Cables along with connections for the same, etc.)	1	Lot		
1.1.2	Thermal Calculations (Normal and emergency continuous current ratings of the switchgear and each main current path component)	1	Lot		
1.1.3	Insulation Coordination Study	1	Lot		
1.1.4	Lightning Surge Overvoltage Study	1	Lot		
1.1.5	Transient Recovery Voltage (TRV) Study for GIS	1	Lot		
1.1.6	Grounding Analysis for entire station	1	Lot		
1.1.7	All the requested settings, Protection Coordination, Relay Test Plan, Configuration and Programming on Intelligent Electronic Device (IEDs) such as Relays, RTUs, Automation system, etc. to ensure normal function of integrated system at substation and with other facilities in the entire power system.	1	Lot		
1.1.8	GIS System Earthing and Bonding Study	1	Lot		
1.1.9	Outdoor Switchyard Lighting Study	1	Lot		
1.1.10	Power Cable Ampacity Study	1	Lot		
1.1.11	Rigid Bus Study	1	Lot		
1.1.12	Power Cable Pulling Tension Calculation	1	Lot		
1.1.13	Any other design work not specifically mentioned above but deemed necessary or as required by employer for satisfactory completion of design work.	1	Lot		
Sub Total 1.1					
1.2	Design Works (Civil)				
Complete Civil Design of New Substation as Specified in Scope and Employers Requirements including but not limited to:					
1.2.1	Geotechnical investigation data and drawings including on-site support during excavation and compaction.	1	Lot		
1.2.2	Hydrological, Environmental and Social Assessment of New Damauli Substation area as described in the Technical Specification	1	Lot		
1.2.3	Surveying and benchmarking design and drawings including on-site support during site preparation.	1	Lot		
1.2.4	Substation Design in Civil, Structural, Mechanical and Architectural, such as foundation works, hot dip galvanised steel supporting structures for all outdoor electrical equipment structures, other civil works like boundary wall etc., substation buildings, roads, cable trenches, water drainage system, oil containment chamber and sump pit, fire walls, earthing works, etc. of new substation complete in all respect.	1	Lot		
1.2.5	Design of rail tracks for movement of power transformers on the reinforced concrete foundations.	1	Lot		
1.2.6	Any Architectural-Related Calculations and Analysis	1	Lot		
1.2.7	Any Mechanical-Related Calculations and Analysis	1	Lot		
1.2.8	Any other design work not specifically mentioned above but deemed necessary or as required by employer for satisfactory completion of design work.	1	Lot		
Sub Total 1.2					
Total(To Schedule No. 5. Grand Summary)					
Name of Bidder:					
Signature of Bidder:					

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied from Abroad

Item No.	Description	Code (a)	Qty.	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
			1			
2.1	AIS HV and MV Equipment					
2.1.1	167 MVA, (400/√3/220/√3/33) kV, Single Phase Auto-Transformer with OLTC, RTCC Facility, Surge protection arrangement (AIS) for HV, IV and LV side and with Bushing CT complete with all accessories as specified		7	Nos		
2.1.2	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering		12	Nos		
2.1.3	Current Transformer (CT), 400kV, Single Phase, Live Tank Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA		12	Nos		
2.1.4	Current Transformer (CT), 72.5kV, Single Phase 2 Windings		6	Nos		
2.1.5	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV		12	Nos		
2.1.6	Station Service Transformer, 630 kVA, 33/0.4kV		2	Nos		
2.1.7	30kV,10kA Lightning arrester for 33kV line bays		6	Nos		
2.1.8	30kV,10kA Lightning arrester for 33/0.4kV station service transformers		6	Nos		
2.1.9	72.5kV Double Break Isolator, Single Phase		1	Lot		
2.1.10	72.5kV Circuit Breaker, Three Phase, 50Hz.		2	Nos		
2.1.11	400kV Bus Support Post Insulator		1	Lot		
2.1.12	72.5kV Bus Support Post Insulator		1	Lot		
2.1.13	Suspension/Tension Insulator Strings, Including Hardware		1	Lot		
2.1.14	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.1						
2.2	Hot Dip Galvanized Steel					
2.2.1	Gantry Column for 400 kV Incoming Line		5	Nos		
2.2.2	Gantry Girder for 400 kV Incoming Line		4	Nos		
2.2.3	Support Structure for 400 kV Current Transformer		12	Nos		
2.2.4	Support Structure for 400 kV Capacitive Voltage Transformer		12	Nos		
2.2.5	Support Structure for 400 kV Surge Arrester		12	Nos		
2.2.6	Support Structure for 400 kV Bus Support		1	Lot		
2.2.7	Support Structure for 72.5 kV Current Transformer		6	Nos		
2.2.8	Support Structure for 72.5 kV Bus Support or Pot Head		1	Lot		
2.2.9	Support Structure for 72.5 kV Single Switch Stand		1	Lot		
2.2.10	Support Structure for 30kV Lightning Arrester		12	Nos.		
2.2.11	Structures for Lightning Mast and other Lighting structures		1	Lot		
2.2.12	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.2						
2.3	Bus Bar and Overhead Connections					
2.3.1	5" AL. Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness		1	Lot		
2.3.2	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)		1	Lot		
2.3.3	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel		1	Lot		
2.3.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.3						
2.4	LV, MV, HV Control and Power Cable					
2.4.1	LV Control Cables		1	Lot		
2.4.2	LV Power Cables		1	Lot		
2.4.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)		1	Lot		

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied from Abroad

Item No.	Description	Code (a)	Qty.	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
2.4.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)		1	Lot		
2.4.5	33kV Cable Pothead		1	Lot		
2.4.6	220 kV HV Cable		1400	mtrs		
	220 kV Termination Bushing Outdoor for Auto connection		7	Nos.		
	220 kV GIS termination		7	Nos.		
2.4.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.		1	Lot		
2.4.8	Power Cable for Filter Plant (Transformer) 3.5CX240 sqmm (Armoured, PVC Insulated) with suitable termination arrangement all complete		1	Lot		
2.4.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.4						
2.5	AC AND DC STATION SUPPLY					
2.5.1	400V AC Main Switch Board					
2.5.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers		3	Nos		
2.5.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers		1	Nos		
2.5.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer		1	Nos		
2.5.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer		1	Nos		
2.5.2	400V AC Main Lighting Board					
2.5.2.1	100KVA Lighting Transformer		2	Nos		
2.5.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker		1	Nos		
2.5.3	400V AC Emergency Lighting Distribution Board					
2.5.3.1	100KVA Lighting Transformer		1	Nos		
2.5.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker		1	Nos		
2.5.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers,		1	Nos		
2.5.4	400V AC Distribution Board					
2.5.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers		1	Nos		
2.5.4.2	400/110V, 50VA, Potential Transformer		3	Nos		
2.5.4.3	400/1A Current Transformer, Class 5P20		1	Nos		
2.5.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers		1	Nos		
2.5.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker		1	Nos		
2.5.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers		1	Nos		
2.5.5	400V AC AMF Panel					

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Item No.	Description	Code (a)	Qty.	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
			1	2	3	(1) x (3)
2.5.5.1	400/1A Current Transformer, Class 1		3	Nos		
2.5.5.2	400/1A Current Transformer, Class 5P20		1	Nos		
2.5.6	DC Chargers and Batteries					
2.5.6.1	220V Battery Charger (Float/Boost)		3	Nos		
2.5.6.2	48V Battery charger (Float/Boost)		3	Nos		
2.5.6.3	250A Throw over Switch, Interlock		6	Nos		
2.5.6.4	Battery, 220Vdc, 108 Minimum Cells		2	Nos		
2.5.6.5	Battery, 48Vdc, 24 Minimum Cells		2	Nos		
2.5.7	DC Distribution Boards					
2.5.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions		2	Nos		
2.5.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions		2	Nos		
2.5.7.3	DC Fuse Box, 220Vdc		1	Lot		
2.5.7.4	DC Fuse Box, 48Vdc		1	Lot		
2.5.8	Other Equipment					
2.5.8.1	Diesel Generator Set, 250kVA (Including Fuel Tank)		1	Nos		
2.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.5						
2.6	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)					
2.6.1	Line/feeder Bay					
2.6.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole		8	Nos		
2.6.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set		16	Nos		
2.6.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set		16	Nos		
2.6.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		16	Nos		
2.6.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set		8	Nos		
2.6.1.6	Voltage Transformers, 400kV, dual secondary, with isolating link, Single-phase, Three-phase set		8	Nos		
2.6.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set		8	Nos		
2.6.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		8	Nos		
2.6.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)		8	Nos		
2.6.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)		8	Nos		
2.6.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices		1	Lot		
2.6.1.12	All metallic structures and supports required for GIS complete with accessories		1	Lot		
2.6.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices		1	Lot		
2.6.1.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Line/feeder Bay Lot		8	Bays		
2.6.2	Transformer bay					
2.6.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device		4	Nos		
2.6.2.1.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set		8	Nos		
2.6.2.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set		8	Nos		
2.6.2.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		8	Nos		

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Item No.	Description	Code (a)	Qty.	Unit	Unit Rate (b) US\$ DDP plus all related cost as defined in foot note	Total Price (c) US\$
			1			
2.6.2.1.5	Transformer Bay High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Three-pole group operated		3	Nos		
2.6.2.1.6	Voltage Transformers, 400kV, dual secondary, with isolating link, single-phase, three-phase set		3	Nos		
2.6.2.1.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set		6	Nos		
2.6.2.1.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set		6	Nos		
2.6.2.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)		4	Nos		
2.6.2.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)		4	Nos		
2.6.2.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices		1	Lot		
2.6.2.1.12	All metallic structures and supports required for GIS complete with accessories		1	Lot		
2.6.2.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices		1	Lot		
2.6.2.1.14	Isolating & Earthing Switches, 400kV, 4000A, 50kA Single phase, and Auxiliary Gas Insulated Bus (GIB) for Spare Transformer, GIS to AIS Bushing termination, jumpers, required CT, AI. tube, metering, control and protection as required all complete. 33kV isolators, 33kV cables, jumpers as required all complete		3	Nos		
2.6.2.1.15	Gas Insulated bus (GIB) and required supports for GIB run whole for Transformer Bay Lot		4	Bays		
2.6.3	Diameter Middle Breaker Bay-400 kV					
2.6.3.1	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole		3	Nos		
2.6.3.2	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device		2	Nos		
2.6.3.3	Current Transformer Modules, Three cores, 400kV, Three-phase set		10	Nos		
2.6.3.4	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set		10	Nos		
2.6.3.5	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		10	Nos		
2.6.3.6	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)		5	Nos		
2.6.3.7	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)		5	Nos		
2.6.3.8	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices		1	Lot		
2.6.3.9	All metallic structures and supports required for GIS complete with accessories		1	Lot		
2.6.3.10	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices		1	Lot		
2.6.4	Gas Insulated BUSBAR					
2.6.4.1	400kV, 3 single phase (isolated), SF6 gas insulated, metal enclosed 4000A bus bars each enclosed in three individual bus enclosures		6	Diameter		

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			1			
2.6.4.2	Voltage Transformers, 400kV, dual secondary, single-phase, three-phase set		2	Nos		
2.6.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set		2	Nos		
2.6.4.4	Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set		2	Nos		
2.6.4.5	Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set		2	Nos		
2.6.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.6						
2.7	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.					
2.7.1	Complete set of Control and Protection panels for 400 kV station as specified in Scope and Employers Requirements including but not limited to:					
2.7.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)		17	Nos		
2.7.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)		8	Nos		
2.7.1.3	Transformer Protection Panel		4	Nos		
2.7.1.4	400kV (Duplicate Bus Bar Protection)		2	Set		
2.7.1.5	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
2.7.2	Complete set of Control and Protection panels for 33 kV station as specified in Scope and Employers Requirements including but not limited to:					
2.7.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)		2	Nos		
2.7.2.2	Transformer Protection Panel		2	Nos		
2.7.2.3	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
2.7.3	Substation Automation & Metering					
2.7.3.1	SAS Operator Station for control of 400/220/33 kV		1	Set		
2.7.3.2	Substation Automation System (SAS) for 400 kV System per diameter		6	Set		
2.7.3.4	Substation Automation System (SAS) for 33kV System per feeder		2	Set		
2.7.3.5	Substation Automation System (SAS) for Auxiliary System		1	Set		
2.7.3.6	Integration of all 400kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.		1	Lot		
2.7.3.7	Telecommunication system of New Damauli		1	Lot		
2.7.3.8	Fibre Optic SDH System		1	Lot		
2.7.3.9	Phone System		1	Lot		
2.7.3.10	400 kV Metering		1	Lot		
2.7.3.11	Miscellaneous Relay and Control Equipment, not included above		1	Lot		
Sub Total 2.7						
2.8	Grounding System					
2.8.1	Stranded Bare Copper 240 Sq. mm** Grid (Including Fusion and Mechanical Connectors)		1	Lot		
2.8.2	Grounding Rods		1	Lot		
2.8.3	Embedded Grounding System - 400kV and 220kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)		1	Lot		
2.8.4	Embedded Grounding System - Control room		1	Lot		

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			1			
2.8.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.8						
2.9	Lightning Protection System					
2.9.1	Overhead Galvanized Steel Wire, Including Hardware		1	Lot		
2.9.2	Lightening Mast for Protection		1	Lot		
2.9.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.9						
2.10	Firefighting System					
2.10.1	Fire protection/detection for 7 (Seven) auto transformers		1	Lot		
2.10.2	Fire protection/detection for 400kV GIS Building		1	Lot		
2.10.3	Fire protection/detection for Control House		1	Lot		
2.10.4	Fire protection/detection system for pump house building		1	Lot		
2.10.5	Fire protection/detection system for generator diesel tank		1	Lot		
2.10.6	Portable fire extinguishers		1	Lot		
2.10.7	Clean-agent fire extinguishers		1	Lot		
2.10.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.10						
2.11	HVAC And Ventilation Systems					
2.11.1	400kV GIS Building HVAC and Ventilation Systems		1	Lot		
2.11.2	Control House HVAC and Ventilation Systems		1	Lot		
Sub Total 2.11						
2.12	Accessories and Ancillary Material					
2.12.1	Junction and marshalling boxes, outdoor		1	Lot		
2.12.2	Junction and marshalling boxes, indoor		1	Lot		
2.12.3	Outdoor lighting, including lighting fixtures		1	Lot		
2.12.4	Indoor lighting, including lighting fixtures		1	Lot		
2.12.5	Control Cabinet for outdoor lighting		1	Lot		
2.12.6	Electric Overhead Travelling Crane for installation and removal of GIS Equipment		1	Lot		
2.12.7	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.		1	Lot		
2.12.8	Visual Monitoring System		1	Lot		
2.12.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.12						
2.13	Mandatory Maintenance, Repair tools and Testing Instruments					
2.13.1	GIS Equipment					
2.13.1.1	400kV GIS SF6 leakage detector, analyzer and processing unit all complete		1	Lot		
2.13.1.2	400kV GIS Wrenches and tools		1	Lot		
2.13.1.3	400kV GIS Pressure gauge		1	Nos		
2.13.1.4	400kV GIS Gas sampling and moisture meter		1	Nos		
2.13.1.5	400kV GIS Micro-Ohmmeter		1	Nos		
2.13.1.6	400kV GIS Circuit-breaker, timing tester		1	Nos		
2.13.1.7	400kV GIS Laptop computer with switcialized software for GIS setting and monitoring		1	Nos		
2.13.1.8	Complete set of SF6 gas service cart mounted on a trailer for mobile application. SF6 gas refilling cart equipped with 1 SF6 gas cylinder and the necessary instruments and adapters for easy and quick gas refilling in case of losses		1	Lot		
2.13.1.9	HV Test Bushing for GIS		1	Lot		
2.13.1.10	Online Partial Discharge Monitoring System		1	Nos		
2.13.2	Auto Transformer & Station Service Transformer					

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			1			
2.13.2.1	Oil-treatment unit 6000lph along with suitable size and quantity of connection arrangement (MCCB (240-300 Amp),terminal lugs etc.) all complete (autotransformer)		1	Nos		
2.13.2.2	Oil dielectric tester		1	Nos		
2.13.2.3	Dielectric tester based on tan δ and dielectric losses , 10 kV		1	Nos		
2.13.2.4	Megger, electronic, 5 kV		1	Nos		
2.13.2.5	Wrenches and tools		1	Lot		
2.13.3	Complete set of Control and Protection panels for Substation					
2.13.3.1	Relay Test Kit		1	Lot		
2.13.3.2	Test Equipment & tools for SAS SYSTEM for measuring, configuration & diagnostics.		1	Lot		
Sub Total 2.13						
2.14	Mandatory Spare Parts					
2.14.1	HV Equipment					
2.14.1.1	Unit of 400kV surge arrester, complete with grading ring, terminals and surge counter		1	Nos		
2.14.1.2	Unit of 220kV surge arrester, complete with grading ring, terminals and surge counter		1	Nos		
2.14.1.3	Capacitive voltage transformer, 400kV		1	Nos		
2.14.1.4	Current transformer, 400kV		1	Nos		
2.14.1.5	Current transformer, 72.5kV		1	Nos		
2.14.2	Auto Transformer					
2.14.2.1	Complete set of gaskets with grease, for cover, manholes, hand holes, and pipping fittings.		2	Nos		
2.14.2.2	Lot of LV control and protective components, minimum one unit of each type of components used		2	Nos		
2.14.2.3	Pressure relief device, complete with accessories		2	Nos		
2.14.2.4	Bushings, one complete unit of each type used, with accessories		2	Nos		
2.14.2.5	Current transformer, one unit of each type		2	Nos		
2.14.2.6	Oil-circulating pump with motor, complete with accessories		2	Nos		
2.14.2.7	Cooling fan, complete with motor		2	Nos		
2.14.2.8	Buchholz relay, complete		2	Nos		
2.14.2.9	One instrument of each type used (temperature, oil level, pressure vent, etc.)		2	Nos		
2.14.2.10	One valve of each type used		2	Nos		
2.14.2.11	Insulating oil, 5% of the volume used		2	Nos		
2.14.2.12	Silica gel, quantity for one load		2	Nos		
2.14.2.13	Tap changer diverter switch, spare contacts and transition resistance		2	Nos		
2.14.2.14	Tap changer selector switch spare contacts		2	Nos		
2.14.2.15	Rolls of Kraft insulating paper		2	Nos		
2.14.2.16	Additional spare parts as per Chapter 3: Auto Transformer Specification of Part 2: Employer's Requirements, Section V-B1 (Technical Specifications).		1	Lot		
2.14.3	630kVA Transformer					
2.14.3.1	All Bushing with metal parts (each voltage rating) for 630 KVA Transformer		1	Nos		
2.14.3.2	Oil Temperature Indicator with sensing device		1	Lot		
2.14.3.3	Tap Changer Contacts		1	Lot		
2.14.3.4	Buchhloz Relay		1	Nos		
2.14.3.5	Explosion vent diaphragm		1	Nos		
2.14.3.6	Set of valve (each type)		1	Lot		
2.14.3.7	3-Phase 11 kV Horn Gap Fuse		1	Lot		
2.14.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.14						

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			1			
2.15	Spare Parts for AC and DC Station Supply					
2.15.1	Spare for LV Switchgear					
2.15.1.1	LV circuit breaker, complete, with CT's and protection devices		1	Nos		
2.15.1.2	Outgoing thermomagnetic breakers - one unit of each type used		2	Nos		
2.15.1.3	Metering - one instrument of each type used		1	Nos		
2.15.1.4	Protection (other than included in LV breaker) One unit of each type used		1	Nos		
2.15.1.5	Automatic Transfer Switch One complete controller including sensors		1	Nos		
2.15.1.6	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.		1	Nos		
2.15.2	Spare for DC Distribution Panels					
2.15.2.1	Thermomagnetic breakers one unit of each type used		2	Nos		
2.15.2.2	Metering - one metering instrument of each type used		1	Nos		
2.15.2.3	Protection (other than included in LV breaker) One unit of each type used		1	Nos		
2.15.2.4	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.		1	Nos		
2.15.3	Spare for Diesel Generator Set					
2.15.3.1	Replaceable elements for air filter		1	Nos		
2.15.3.2	Replaceable elements for oil filter		1	Nos		
2.15.3.3	Replaceable elements for fuel filter		1	Nos		
2.15.3.4	Complete set of injectors		1	Nos		
2.15.3.5	Fuel injector pump		1	Nos		
2.15.3.6	Oil pump		1	Nos		
2.15.3.7	Intake valves		1	Nos		
2.15.3.8	Seats for intake valves		1	Nos		
2.15.3.9	Exhaust valves		1	Nos		
2.15.3.10	Set for exhaust valves		1	Nos		
2.15.3.11	Disconnect switch, with grounding blades, 245 kV, 3 Ø		1	Nos		
2.15.3.12	Set of pistons		1	Nos		
2.15.3.13	Set of complete bearings of the engine		1	Nos		
2.15.3.14	Set of all gaskets needed for the engine		1	Nos		
2.15.3.15	Set of thermostats		1	Nos		
2.15.3.16	Set of bearings for the alternator		1	Nos		
2.15.3.17	Set of control cards, at least one unit of each type used		1	Nos		
2.15.3.18	Diodes and thyristors of each type used		3	Nos		
2.15.3.19	Lamp, one unit of each type used		10	Nos		
2.15.3.20	Auxiliary relay, one unit of each type used		1	Nos		
2.15.3.21	Multifunction metering instrument		1	Nos		
2.15.3.22	Voltage and speed regulator component and actuator		1	Nos		
2.15.3.23	Controller components		1	Nos		
2.15.3.24	Instrument, detectors		1	Nos		
2.15.4	Spare for Batteries					
2.15.4.1	One unit of battery used in 220 V DC system		2	Nos		
2.15.4.2	Loose parts for 220 V DC - connection elements, cables, links, etc.		1	Nos		
2.15.4.3	One unit of battery used in 48 Vdc system		1	Nos		
2.15.4.4	Loose parts for 48 V DC - connection elements, cables, links, etc.		1	Nos		
2.15.5	Spare for Battery Chargers					
2.15.5.1	Complete bridge of thyristors assembled on a cooling base		1	Nos		
2.15.5.2	Controller, complete including each type of card used		1	Nos		
2.15.5.3	Loose elements - auxiliary relays, breakers, metering instruments, control switches, fuses, etc.		1	Nos		

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			1			
2.15.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.15						
2.16	Mandatory spare parts - Miscellaneous material					
2.16.1	Junction and marshalling boxed, outdoor, one of each type used		1	Nos		
2.16.2	Junction and marshalling boxed, indoor, one of each type used		1	Nos		
2.16.3	Outdoor lighting fixture, one unit of each type used		3	Nos		
2.16.4	Post-type insulator, one unit of each type used		2	Nos		
2.16.5	Suspension insulator, 5% of the total used		1	Nos		
2.16.6	Bus bar (rigid and strain) hardware, including, connectors, terminals, separator, corona rings, 5% of each type used, minimum one unit		1	Nos		
2.16.7	Grounding conductors, 5% of the installed conductors (stranded copper conductor, rectangular-shape copper bar and grounding rod)		1	Nos		
2.16.8	Fusion connection material, including molds, welding powder and installation tools, quantity required to make 5% of the total executed connections		1	Nos		
2.16.9	Mechanical connectors for grounding, 5% of the total executed connections		1	Nos		
2.16.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.16						
2.17	Mandatory spare parts for 400kV					
2.17.1	Spare Gas					
2.17.1.1	SF6 bottles required to fill the two largest volume compartments		1	Lot		
2.17.2	Circuit Breakers, 4000 A, 50kA					
2.17.2.1	Circuit breaker, complete pole assembly		1	Lot		
2.17.2.2	Complete sets of main contacts		1	Lot		
2.17.2.3	Complete sets of arcing contacts		2	Lot		
2.17.2.4	Operating mechanism, complete		1	Lot		
2.17.2.5	Operating mechanism motor		2	Lot		
2.17.2.6	Closing coils		4	Lot		
2.17.2.7	Tripping coils		4	Lot		
2.17.3	Disconnect-Switches, 4000 A					
2.17.3.1	Disconnect-Switch, complete pole		1	Nos		
2.17.3.2	Complete set of contacts		2	Nos		
2.17.3.3	Operating mechanism, complete		1	Nos		
2.17.3.4	Operating mechanism motor		2	Nos		
2.17.4	Maintenance Earthing Switches					
2.17.4.1	Earthing-Switch, complete pole		1	Nos		
2.17.4.2	Complete set of contacts		2	Nos		
2.17.4.3	Operating mechanism, complete		1	Nos		
2.17.4.4	Operating mechanism motor		2	Nos		
2.17.5	High-speed earthing Switches					
2.17.5.1	High-speed earthing switch, complete pole		1	Nos		
2.17.5.2	Complete set of contacts		2	Nos		
2.17.5.3	Operating mechanism, complete		1	Nos		
2.17.5.4	Operating mechanism motor		2	Nos		
2.17.6	Other Equipment					
2.17.6.1	Voltage transformer, 400 kV, complete with disconnecting and earthing switch		3	Nos		
2.17.6.2	Current transformer, metering core, loose part		6	Nos		
2.17.6.3	Current transformer, protection core, loose part		6	Nos		
2.17.7	400kV GIS Bay, Local Control Cabinet					

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Breakdown of Rates and Prices Schedule No. 2. Plant, Goods and Equipment(Including Mandatory Spare Parts) Supplied from Abroad

Item No.	Description	Code (a)	Qty.	Unit	Unit Rate (b)	Total Price (c)
			1		2	US\$ DDP plus all related cost as defined in foot note
2.17.7.1	One Bay Local Control Cabinet complete, wired, with all specified devices		1	Lot		
2.17.8	<u>Bus bar Elements</u>					
2.17.8.1	Bus conductor elements		1	Lot		
2.17.8.2	Bus connection elements		1	Lot		
2.17.8.3	GIS insulators, one of each type used		1	Lot		
2.17.8.4	Pressure relief elements		1	Lot		
2.17.9	<u>SF6-to-Air Bushing Modules</u>					
2.17.9.1	SF6-to-air bushing module, 400 kV, single phase		1	Lot		
2.17.10	<u>Loose Spare Parts</u>					
2.17.10.1	5% of auxiliary relays, control devices, fuses, terminal blocks, etc. minimum one unit of each type used		1	Lot		
2.17.11	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.17						
2.18	<u>Spare of LV, MV, HV Control and Power cables</u>					
2.18.1	LV control cable, 5% of the installed cables		1	Lot		
2.18.2	LV, MV power cable, 5% of the installed cables		1	Lot		
2.18.3	Cable installation accessories - 5% of the installed material		1	Lot		
2.18.4	220 kV HV Cable (continuous cable for the longest length installed)		1	Lot		
	220 kV Termination Bushing Outdoor for Auto connection		1	Nos.		
	220 kV GIS termination		1	Nos.		
2.18.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		1	Lot		
Sub Total 2.18						
2.19	<u>Spare parts of Mechanical Equipment</u>					
2.19.1	<u>Fire protection</u>					
2.19.1.1	Fire protection/detection for auto transformer - one unit of each type used		1	Lot		
2.19.1.2	Clean-agent fire extinguisher		1	Lot		
2.19.1.3	Control building general fire protection/detection system, one unit of each component used		1	Lot		
2.19.1.4	GIS building general fire protection/detection system, one unit of each component used		1	Lot		
2.19.2	<u>Control building HVAC system</u>					
2.19.2.1	Throwaway air filters per air conditioning unit		1	Lot		
2.19.2.2	Pulley belts per air conditioning unit motor		1	Lot		
2.19.2.3	Thermostat per air conditioning unit		1	Lot		
2.19.3	<u>GIS building ventilation system</u>					
2.19.3.1	Throwaway air filters per ventilation system		1	Lot		

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Breakdown of Rates and Prices Schedule No. 3. Plant, Goods and Equipment (Including Mandatory Spare Parts) Supplied from Within the Employer's Country					
Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.1	AIS HV and MV Equipment				
3.1.1	167 MVA, (400/√3/220/√3/33) kV, Single Phase Auto-Transformer with OLTC, RTCC Facility, Surge protection arrangement (AIS) for HV, IV and LV side and with Bushing CT complete with all accessories as specified	7	Nos		
3.1.2	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	12	Nos		
3.1.3	Current Transformer (CT), 400kV, Single Phase, Tank Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	12	Nos		
3.1.4	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
3.1.5	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	12	Nos		
3.1.6	Station Service Transformer, 630 kVA, 33/0.4kV	2	Nos		
3.1.7	30kV,10kA Lightning arrester for 33kV line bays	6	Nos		
3.1.8	30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
3.1.9	72.5kV Double Break Isolator, Single Phase	1	Lot		
3.1.10	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
3.1.11	400kV Bus Support Post Insulator	1	Lot		
3.1.12	72.5kV Bus Support Post Insulator	1	Lot		
3.1.13	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
3.1.14	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.1					
3.2	Hot Dip Galvanized Steel				
3.2.1	Gantry Column for 400 kV Incoming Line	5	Nos		
3.2.2	Gantry Girder for 400 kV Incoming Line	4	Nos		
3.2.3	Support Structure for 400 kV Current Transformer	12	Nos		
3.2.4	Support Structure for 400 kV Capacitive Voltage Transformer	12	Nos		
3.2.5	Support Structure for 400 kV Surge Arrester	12	Nos		
3.2.6	Support Structure for 400 kV Bus Support	1	Lot		
3.2.7	Support Structure for 72.5 kV Current Transformer	6	Nos		
3.2.8	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
3.2.9	Support Structure for 72.5 kV Single Switch Stand	1	Lot		
3.2.10	Support Structure for 30kV Lightning Arrestor	12	Nos.		
3.2.11	Structures for Lightning Mast and other Lighting structures	1	Lot		
3.2.12	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.2					
3.3	Bus Bar and Overhead Connections				
3.3.1	5" AL. Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
3.3.2	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		
3.3.3	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		
3.3.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.3					
3.4	LV, MV, HV Control and Power Cable				
3.4.1	LV Control Cables	1	Lot		
3.4.2	LV Power Cables	1	Lot		
3.4.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		
3.4.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.4.5	33kV Cable Pothead	1	Lot		
3.4.6	220 kV HV Cable	1400	mtrs		
	220 kV Termination Bushing Outdoor for Auto connection	7	Nos.		
	220 kV GIS termination	7	Nos.		
3.4.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
3.4.8	Power Cable for Filter Plant (Transformer) of suitable size with termination arrangement	1	Lot		
3.4.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.4					
3.5	AC AND DC STATION SUPPLY				
3.5.1	400v AC Main Switch Board				
3.5.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
3.5.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
3.5.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
3.5.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
3.5.2	400v AC Main Lighting Board				
3.5.2.1	100KVA Lighting Transformer	2	Nos		
3.5.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
3.5.3	400v AC Emergency Lighting Distribution Board				
3.5.3.1	100KVA Lighting Transformer	1	Nos		
3.5.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker	1	Nos		
3.5.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers	1	Nos		
3.5.4	400v AC Distribution Board				
3.5.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
3.5.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
3.5.4.3	400/1A Current Transformer, Class 5P20	1	Nos		
3.5.4.4	400V Switchgear with Automation Controls, 630A with 2 Current Transformers	1	Nos		
3.5.4.5	400v Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		
3.5.4.6	400v Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
3.5.5	400v AC AMF Panel				
3.5.5.1	400/1A Current Transformer, Class 1	3	Nos		
3.5.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
3.5.6	DC Chargers and Batteries				

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.5.6.1	220V Battery Charger (Float/Boost)	3	Nos		
3.5.6.2	48V Battery charger (Float/Boost)	3	Nos		
3.5.6.3	250A Throw over Switch, Interlock	6	Nos		
3.5.6.4	Battery, 220Vdc, 108 Minimum Cells	2	Nos		
3.5.6.5	Battery, 48Vdc, 24 Minimum Cells	2	Nos		
3.5.7	DC Distribution Boards				
3.5.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
3.5.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
3.5.7.3	DC Fuse Box, 220Vdc	1	Lot		
3.5.7.4	DC Fuse Box, 48Vdc	1	Lot		
3.5.8	Other Equipment				
3.5.8.1	Diesel Generator Set, 250kVA (Including Full Tank)	1	Nos		
3.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.5					
3.6	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
3.6.1	Line/feeder Bay				
3.6.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	8	Nos		
3.6.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set	16	Nos		
3.6.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	16	Nos		
3.6.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	16	Nos		
3.6.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set	8	Nos		
3.6.1.6	Voltage Transformers, 400kV, dual secondary, with isolating link, Single-phase, Three-phase set	8	Nos		
3.6.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	8	Nos		
3.6.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	8	Nos		
3.6.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	8	Nos		
3.6.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	8	Nos		
3.6.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.1.14	Gas Insulated bus (GIB) and required supports for GIB run whole for Line/feeder Bay Lot	8	Bays		
3.6.2	Transformer bay				
3.6.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
3.6.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	8	Nos		
3.6.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	8	Nos		
3.6.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	8	Nos		
3.6.2.5	Transformer Bay High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Three-pole group operated	3	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.6.2.6	Voltage Transformers, 400kV, dual secondary, with isolating link, single-phase, three-phase set	3	Nos		
3.6.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	6	Nos		
3.6.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set	6	Nos		
3.6.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
3.6.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
3.6.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.2.14	Isolating & Earthing Switches, 400kV, 4000A, 50kA Single phase, and Auxiliary Gas Insulated Bus (GIB) for Spare Transformer, GIS to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete. 33kV isolators, 33kV cables, jumpers as required all complete	3	Nos		
3.6.2.15	Gas Insulated bus (GIB) and required supports for GIB run whole for Transformer Bay Lot	4	Bays		
3.6.3	<u>Diameter Middle Breaker Bay-400 kV</u>				
3.6.3.1	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	3	Nos		
3.6.3.2	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	2	Nos		
3.6.3.3	Current Transformer Modules, Three cores, 400kV, Three-phase set	10	Nos		
3.6.3.4	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	10	Nos		
3.6.3.5	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	10	Nos		
3.6.3.6	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	5	Nos		
3.6.3.7	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	5	Nos		
3.6.3.8	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
3.6.3.9	All metallic structures and supports required for GIS complete with accessories	1	Lot		
3.6.3.10	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
3.6.4	<u>Gas Insulated BUSBAR</u>				
3.6.4.1	400kV, 3 single phase (isolated), SF6 gas insulated, metal enclosed 4000A bus bars each enclosed in three individual bus enclosures	6	Diameter		
3.6.4.2	Voltage Transformers, 400kV, dual secondary, single-phase, three-phase set	2	Nos		
3.6.4.3	Main Bus Bar High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	2	Nos		
3.6.4.4	Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	2	Nos		
3.6.4.5	Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	2	Nos		

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Breakdown of Rates and Prices Schedule No. 3. Plant, Goods and Equipment (Including Mandatory Spare Parts) Supplied from Within the Employer's Country					
Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.6.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 3.6					
3.7	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.				
3.7.1	Complete set of Control and Protection panels for 400 kV station as specified in Scope and Employers Requirements including but not limited to:				
3.7.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	17	Nos		
3.7.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)	8	Nos		
3.7.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no, Auto Trans Bay 2=1no)	4	Nos		
3.7.1.4	400kV (Duplicate Bus Bar Protection)	2	Set		
3.7.1.5	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.7.2	Complete set of Control and Protection panels for 33 kV station as specified in Scope and Employers Requirements including but not limited to:				
3.7.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
3.7.2.2	Transformer Protection Panel	2	Nos		
3.7.2.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
3.7.3	Substation Automation & Metering				
3.7.3.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
3.7.3.2	Substation Automation System (SAS) for 400 kV System per diameter	6	Set		
3.7.3.3	Substation Automation System (SAS) for 33kV System per feeder	2	Set		
3.7.3.4	Substation Automation System (SAS) for Auxiliary System	1	Set		
3.7.3.5	Integration of all 400kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
3.7.3.6	Telecommunication system for New Damauli	1	Lot		
3.7.3.7	Fibre Optic SDH System	1	Lot		
3.7.3.8	Phone System	1	Lot		
3.7.3.9	400 kV Metering	1	Lot		
3.7.3.10	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
Sub Total 3.7					
3.8	Grounding System				
3.8.1	Stranded Bare Copper 240 Sq. mm Grid (Including Fusion and Mechanical Connectors)	1	Lot		
3.8.2	Grounding Rods	1	Lot		
3.8.3	Embedded Grounding System - 400kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
3.8.5	Embedded Grounding System - Control room	1	Lot		
3.8.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.8					
3.9	Lightning Protection System				
3.9.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
3.9.2	Lightening Mast for Protection	1	Lot		
3.9.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.9					
3.10	Firefighting System				
3.10.1	Fire protection/detection for 7 (Seven) auto transformers	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b)	Total Price (c)
				US\$ EXW plus all related cost as defined in foot note	US\$
				2	3
					(1) x (3)
3.10.2	Fire protection/detection for 400kV GIS Building	1	Lot		
3.10.3	Fire protection/detection for Control House	1	Lot		
3.10.4	Fire protection/detection system for pump house building	1	Lot		
3.10.5	Fire protection/detection system for generator diesel tank	1	Lot		
3.10.6	Portable fire extinguishers	1	Lot		
3.10.7	Clean-agent fire extinguishers	1	Lot		
3.10.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.10					
3.11	HVAC And Ventilation Systems				
3.11.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
3.11.2	Control House HVAC and Ventilation Systems	1	Lot		
Sub Total 3.11					
3.12	Accessories and Ancillary Material				
3.12.1	Junction and marshalling boxes, outdoor	1	Lot		
3.12.2	Junction and marshalling boxes, indoor	1	Lot		
3.12.3	Outdoor lighting, including lighting fixtures	1	Lot		
3.12.4	Indoor lighting, including lighting fixtures	1	Lot		
3.12.5	Control Cabinet for outdoor lighting	1	Lot		
3.12.6	Electric Overhead Travelling Crane for installation and removal of GIS Equipment	1	Lot		
3.12.7	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
3.12.8	Visual Monitoring System	1	Lot		
3.12.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.12					
3.13	Mandatory Maintenance, Repair tools and Testing Instruments				
3.13.1	GIS Equipment				
3.13.1.1	400kV GIS SF6 leakage detector, analyzer and processing unit all complete	1	Lot		
3.13.1.2	400kV GIS Wrenches and tools	1	Lot		
3.13.1.3	400kV GIS Pressure gauge	1	Nos		
3.13.1.4	400kV GIS Gas sampling and moisture meter	1	Nos		
3.13.1.5	400kV GIS Micro-Ohmmeter	1	Nos		
3.13.1.6	400kV GIS Circuit-breaker, timing tester	1	Nos		
3.13.1.7	400kV GIS Laptop computer with switcialized software for GIS setting and monitoring	1	Nos		
3.13.1.8	Complete set of SF6 gas service cart mounted on a trailer for mobile application. SF6 gas refilling cart equipped with 1 SF6 gas cylinder and the necessary instruments and adapters for easy and quick gas refilling in case of losses	1	Lot		
3.13.1.9	HV Test Bushing for GIS	1	Lot		
3.13.1.10	Online Partial Discharge Monitoring System	1	Nos		
3.13.2	Auto Transformer & Station Service Transformer				
3.13.2.1	Oil-treatment unit 6000lph along with suitable size and quantity of connection arrangement (MCCB (240-300 Amp),terminal lugs etc.) all complete (autotransformer)	1	Nos		
3.13.2.2	Oil dielectric tester	1	Nos		
3.13.2.3	Dielectric tester based on tan δ and dielectric losses , 10 kV	1	Nos		
3.13.2.4	Megger, electronic, 5 kV	1	Nos		
3.13.2.5	Wrenches and tools	1	Lot		
3.13.3	Complete set of Control and Protection panels for Substation				
3.13.3.1	Relay Test Kit	1	Lot		
3.13.3.2	Test Equipment & tools for SAS SYSTEM for measuring, configuration & diagnostics.	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
Sub Total 3.13					
3.14	Mandatory Spare Parts				
3.14.1	HV Equipment				
3.14.1.1	Unit of 400kV surge arrester, complete with grading ring, terminals and surge counter	1	Nos		
3.14.1.2	Unit of 220kV surge arrester, complete with grading ring, terminals and surge counter	1	Nos		
3.14.1.3	Capacitive voltage transformer, 400kV	1	Nos		
3.14.1.4	Current transformer, 400kV	1	Nos		
3.14.1.5	Current transformer, 72.5kV	1	Nos		
3.14.2	Auto Transformer				
3.14.2.1	Complete set of gaskets with grease, for cover, manholes, hand holes, and pipping fittings.	2	Nos		
3.14.2.2	Lot of LV control and protective components, minimum one unit of each type of components used	2	Nos		
3.14.2.3	Pressure relief device, complete with accessories	2	Nos		
3.14.2.4	Bushings, one complete unit of each type used, with accessories	2	Nos		
3.14.2.5	Current transformer, one unit of each type	2	Nos		
3.14.2.6	Oil-circulating pump with motor, complete with accessories	2	Nos		
3.14.2.7	Cooling fan, complete with motor	2	Nos		
3.14.2.8	Buchholz relay, complete	2	Nos		
3.14.2.9	One instrument of each type used (temperature, oil level, pressure vent, etc.)	2	Nos		
3.14.2.10	One valve of each type used	2	Nos		
3.14.2.11	Insulating oil, 5% of the volume used	2	Nos		
3.14.2.12	Silica gel, quantity for one load	2	Nos		
3.14.2.13	Tap changer diverter switch, spare contacts and transition resistance	2	Nos		
3.14.2.14	Tap changer selector switch spare contacts	2	Nos		
3.14.2.15	Rolls of Kraft insulating paper	2	Nos		
3.14.2.16	Additional spare parts as per Chapter 3: Auto Transformer Specification of Part 2: Employer's Requirements, Section V- B1 (Technical Specifications).	1	Lot		
3.14.3	630kVA Transformer				
3.14.3.1	All Bushing with metal parts (each voltage rating) for 630 KVA Transformer	1	Nos		
3.14.3.2	Oil Temperature Indicator with sensing device	1	Lot		
3.14.3.3	Tap Changer Contacts	1	Lot		
3.14.3.4	Buchhloz Relay	1	Nos		
3.14.3.5	Explosion vent diaphragm	1	Nos		
3.14.3.6	Set of valve (each type)	1	Lot		
3.14.3.7	3-Phase 11 kV Horn Gap Fuse	1	Lot		
3.14.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.14					
3.15	Spare Parts for AC and DC Station Supply				
3.15.1	Spare for LV Switchgear				
3.15.1.1	LV circuit breaker, complete, with CT's and protection devices	1	Nos		
3.15.1.2	Outgoing thermomagnetic breakers - one unit of each type used	2	Nos		
3.15.1.3	Metering - one instrument of each type used	1	Nos		
3.15.1.4	Protection (other than included in LV breaker) One unit of each type used	1	Nos		
3.15.1.5	Automatic Transfer Switch One complete controller including sensors	1	Nos		
3.15.1.6	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.	1	Nos		
3.15.2	Spare for DC Distribution Panels				

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.15.2.1	Thermomagnetic breakers one unit of each type used	2	Nos		
3.15.2.2	Metering - one metering instrument of each type used	1	Nos		
3.15.2.3	Protection (other than included in LV breaker) One unit of each type used	1	Nos		
3.15.2.4	One or 5% of loose material Auxiliary relays, contactors, fuses, terminals, etc.	1	Nos		
3.15.3	Spare for Diesel Generator Set				
3.15.3.1	Replaceable elements for air filter	1	Nos		
3.15.3.2	Replaceable elements for oil filter	1	Nos		
3.15.3.3	Replaceable elements for fuel filter	1	Nos		
3.15.3.4	Complete set of injectors	1	Nos		
3.15.3.5	Fuel injector pump	1	Nos		
3.15.3.6	Oil pump	1	Nos		
3.15.3.7	Intake valves	1	Nos		
3.15.3.8	Seats for intake valves	1	Nos		
3.15.3.9	Exhaust valves	1	Nos		
3.15.3.10	Set for exhaust valves	1	Nos		
3.15.3.11	Disconnect switch, with grounding blades, 245 kV, 3 Ø	1	Nos		
3.15.3.12	Set of pistons	1	Nos		
3.15.3.13	Set of complete bearings of the engine	1	Nos		
3.15.3.14	Set of all gaskets needed for the engine	1	Nos		
3.15.3.15	Set of thermostats	1	Nos		
3.15.3.16	Set of bearings for the alternator	1	Nos		
3.15.3.17	Set of control cards, at least one unit of each type used	1	Nos		
3.15.3.18	Diodes and thyristors of each type used	3	Nos		
3.15.3.19	Lamp, one unit of each type used	10	Nos		
3.15.3.20	Auxiliary relay, one unit of each type used	1	Nos		
3.15.3.21	Multifunction metering instrument	1	Nos		
3.15.3.22	Voltage and speed regulator component and actuator	1	Nos		
3.15.3.23	Controller components	1	Nos		
3.15.3.24	Instrument, detectors	1	Nos		
3.15.4	Spare for Batteries				
3.15.4.1	One unit of battery used in 220 Vdc system	2	Nos		
3.15.4.2	Loose parts for 220 Vdc - connection elements, cables, links, etc.	1	Nos		
3.15.4.3	One unit of battery used in 48 Vdc system	1	Nos		
3.15.4.4	Loose parts for 48 Vdc - connection elements, cables, links, etc.	1	Nos		
3.15.5	Spare for Battery Chargers				
3.15.5.1	Complete bridge of thyristors assembled on a cooling base	1	Nos		
3.15.5.2	Controller, complete including each type of card used	1	Nos		
3.15.5.3	Loose elements - auxiliary relays, breakers, metering instruments, control switches, fuses, etc.	1	Nos		
3.15.6	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.15					
3.16	Mandatory spare parts - Miscellaneous material				
3.16.1	Junction and marshalling boxed, outdoor, one of each type used	1	Nos		
3.16.2	Junction and marshalling boxed, indoor, one of each type used	1	Nos		
3.16.3	Outdoor lighting fixture, one unit of each type used	3	Nos		
3.16.4	Post-type insulator, one unit of each type used	2	Nos		
3.16.5	Suspension insulator, 5% of the total used	1	Nos		
3.16.6	Bus bar (rigid and strain) hardware, including, connectors, terminals, separator, corona rings, 5% of each type used, minimum one unit	1	Nos		
3.16.7	Grounding conductors, 5% of the installed conductors (stranded copper conductor, rectangular-shape copper bar and grounding rod)	1	Nos		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.16.8	Fusion connection material, including molds, welding powder and installation tools, quantity required to make 5% of the total executed connections	1	Nos		
3.16.9	Mechanical connectors for grounding, 5% of the total executed connections	1	Nos		
3.16.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.16					
3.17	Mandatory spare parts for 400kV				
3.17.1	<u>Spare Gas</u>				
3.17.1.1	SF6 bottles required to fill the two largest volume compartments	1	Lot		
3.17.2	<u>Circuit Breakers, 4000 A, 50kA</u>				
3.17.2.1	Circuit breaker, complete pole assembly	1	Lot		
3.17.2.2	Complete sets of main contacts	1	Lot		
3.17.2.3	Complete sets of arcing contacts	2	Lot		
3.17.2.4	Operating mechanism, complete	1	Lot		
3.17.2.5	Operating mechanism motor	2	Lot		
3.17.2.6	Closing coils	4	Lot		
3.17.2.7	Tripping coils	4	Lot		
3.17.3	<u>Disconnect-Switches, 4000 A</u>				
3.17.3.1	Disconnect-Switch, complete pole	1	Nos		
3.17.3.2	Complete set of contacts	2	Nos		
3.17.3.3	Operating mechanism, complete	1	Nos		
3.17.3.4	Operating mechanism motor	2	Nos		
3.17.4	<u>Maintenance Earthing Switches</u>				
3.17.4.1	Earthing-Switch, complete pole	1	Nos		
3.17.4.2	Complete set of contacts	2	Nos		
3.17.4.3	Operating mechanism, complete	1	Nos		
3.17.4.4	Operating mechanism motor	2	Nos		
3.17.5	<u>High-speed earthing Switches</u>				
3.17.5.1	High-speed earthing switch, complete pole	1	Nos		
3.17.5.2	Complete set of contacts	2	Nos		
3.17.5.3	Operating mechanism, complete	1	Nos		
3.17.5.4	Operating mechanism motor	2	Nos		
3.17.6	<u>Other Equipment</u>				
3.17.6.1	Voltage transformer, 400 kV, complete with disconnecting and earthing switch	3	Nos		
3.17.6.2	Current transformer, metering core, loose part	6	Nos		
3.17.6.3	Current transformer, protection core, loose part	6	Nos		
3.17.7	<u>400kV GIS Bay, Local Control Cabinet</u>				
3.17.7.1	One Bay Local Control Cabinet complete, wired, with all specified devices	1	Lot		
3.17.8	<u>Bus bar Elements</u>				
3.17.8.1	Bus conductor elements	1	Lot		
3.17.8.2	Bus connection elements	1	Lot		
3.17.8.3	GIS insulators, one of each type used	1	Lot		
3.17.8.4	Pressure relief elements	1	Lot		
3.17.9	<u>SF6-to-Air Bushing Modules</u>				
3.17.9.1	SF6-to-air bushing module, 400 kV, single phase	1	Lot		
3.17.10	<u>Loose Spare Parts</u>				
3.17.10.1	5% of auxiliary relays, control devices, fuses, terminal blocks, etc. minimum one unit of each type used	1	Lot		
3.17.10.2	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.17					
3.18	<u>Spare of LV, MV, HV Control and Power cables</u>				
3.18.1	LV control cable, 5% of the installed cables	1	Lot		

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.18.2	LV, MV power cable, 5% of the installed cables	1	Lot		
3.18.3	Cable installation accessories - 5% of the installed material	1	Lot		
3.18.4	220 kV HV Cable (continuous cable for the longest length installed)	1	Lot		
	220 kV Termination Bushing Outdoor for Auto connection	1	Nos.		
	220 kV GIS termination	1	Nos.		
3.18.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.18					
3.19	Spare parts of Mechanical Equipment				
3.19.1	<u>Fire protection</u>				
3.19.1.1	Fire protection/detection for auto transformer - one unit of each type used	1	Lot		
3.19.1.2	Clean-agent fire extinguisher	1	Lot		
3.19.1.3	Control building general fire protection/detection system, one unit of each component used	1	Lot		
3.19.1.4	GIS building general fire protection/detection system, one unit of each component used	1	Lot		
3.19.2	<u>Control building HVAC system</u>				
3.19.2.1	Throwaway air filters per air conditioning unit	1	Lot		
3.19.2.2	Pulley belts per air conditioning unit motor	1	Lot		
3.19.2.3	Thermostat per air conditioning unit	1	Lot		
3.19.3	<u>GIS building ventilation system</u>				

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Item No.	Description	Qty	Unit	Unit Rate (b) US\$ EXW plus all related cost as defined in foot note	Total Price (c) US\$
			2	3	(1) x (3)
3.19.3.1	Throwaway air filters per ventilation system	1	Lot		
3.19.3.2	Pulley belts per ventilation unit motor	1	Lot		
3.19.3.3	Thermostat per ventilation unit	1	Lot		
3.17.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 3.19					
Total(To Schedule No. 5. Grand Summary)					
Name of the Bidder:					
Signature of Bidder:					

Note:

***:This value is indicative, the Contractor will validate as per item 1.1.6 of Design Works (Electrical)

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Breakdown of Rates and Prices Schedule No. 4. Installation and Other Services including all related Civil Works

Item No.	Description	Total
4.1	Breakdown of General Installation and Construction Items (from Schedule No. 4.1)	
4.2	Breakdown of Earthworks (from Schedule No.4.2)	
4.3	Breakdown of Civil Works (from Schedule No.4.3)	
4.4	Other Installation Services (from Schedule No.4.5)	
4.5	Total Excluding Summary of Breakdown of Day works (from Schedule 4.4) (Carried forward to Grand SC-5)	
4.6	Summary of Breakdown of Day works (from Schedule 4.4) (Carried forward to Grand SC-5)	
4.7	Total Including Breakdown of Day works.	
	Name of the Bidder:	
	Signature of Bidder:	

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Schedule No. 4.1: Breakdown of General Installation and Construction Items

Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
				US\$	(1)x(3)
4.1.1	Electromechanical Works General				
4.1.1.1	Indoor and outdoor storage facilities for storing equipment and material in substation	1	Lot		
4.1.1.2	Site Office, Accommodation and vehicular arrangement as Specified in PSR	1	Lot		
4.1.1.3	Operation and Maintenance Manuals and Procedures	1	Lot		
4.1.1.4	"As-Built" Drawings for All Works including civil, building, mechanical etc.	1	Lot		
4.1.1.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.1					
4.1.2	AIS HV and MV Equipment Installation				
4.1.2.1	167 MVA, (400/√3/220/√3/33) kV, Single Phase Auto-Transformer with OLTC, RTCC Facility, Surge protection arrangement (AIS) for HV, IV and LV side and with Bushing CT complete with all accessories as specified	7	Nos		
4.1.2.2	Capacitive Voltage Transformer (CVT) 400kV, Single Phase 2 Windings, Secondary Voltage 110V, Accuracy 0.2, Min Burden 50VA, Application Metering	12	Nos		
4.1.2.3	Current Transformer (CT), 400kV, Single Phase, Tank Type, 3 Core, 2000-1000-500/1A, Class 0.2, Rated Output 15VA	12	Nos		
4.1.2.4	Current Transformer (CT), 72.5kV, Single Phase 2 Windings	6	Nos		
4.1.2.5	400kV Surge Arrester (SA), Zinc Oxide 366 kV Rated Voltage, 20kA, 12kJ/kV	12	Nos		
4.1.2.6	Substation Service Transformer, 630 kVA, 33kV/0.400 V	2	Nos		
4.1.2.7	30kV,10kA Lightning arrester for 33kV line bays	6	Nos		
4.1.2.8	30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
4.1.2.9	72.5kV Double Break Isolator, Single Phase	1	Lot		
4.1.2.10	72.5kV Circuit Breaker, Three Phase, 50Hz.	2	Nos		
4.1.2.11	400kV Bus Support Post Insulator	1	Lot		
4.1.2.12	72.5kV Bus Support Post Insulator	1	Lot		
4.1.2.13	Suspension/Tension Insulator Strings, Including Hardware	1	Lot		
4.1.2.14	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.2					
4.1.3	Hot Dip Galvanized Steel Installation				
4.1.3.1	Gantry Column for 400 kV Incoming Line	5	Nos		
4.1.3.2	Gantry Girder for 400 kV Incoming Line	4	Nos		
4.1.3.3	Support Structure for 400 kV Current Transformer	12	Nos		
4.1.3.4	Support Structure for 400 kV Capacitive Voltage Transformer	12	Nos		
4.1.3.5	Support Structure for 400 kV Surge Arrester	12	Nos		
4.1.3.6	Support Structure for 400 kV Bus Support	1	Lot		
4.1.3.7	Support Structure for 72.5 kV Current Transformer	6	Nos		
4.1.3.8	Support Structure for 72.5 kV Bus Support or Pot Head	1	Lot		
4.1.3.9	Support Structure for 72.5 kV Single Switch Stand	1	Nos		
4.1.3.10	Support Structure for 30kV Lightning Arrestor	12	Nos		
4.1.3.11	Structures for Lightning Mast and other Lighting structures	1	Lot		
4.1.3.12	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.3					
4.1.4	Bus Bar and Overhead Connections Installation				
4.1.4.1	5" AL Tubular Bus Bar 141.30mm Outer Diameter, 9.53mm Thickness	1	Lot		
4.1.4.2	Bus bar Connectors and Hardware (Tube to NEMA Pads, Bus Supports, etc..)	1	Lot		
4.1.4.3	Bare Cond. ACSR 54 Strand 3.53mm AL 7 Strands 3.53mm Steel	1	Lot		

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Schedule No. 4.1: Breakdown of General Installation and Construction Items

Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
				US\$	(1)x(3)
4.1.4.4	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.4					
4.1.5	LV, MV, HV Control and Power Cable Installation				
4.1.5.1	LV Control Cables	1	Lot		
4.1.5.2	LV Power Cables	1	Lot		
4.1.5.3	Cable Installation Accessories (Cable Gland, Labels Terminal Strips, etc..)	1	Lot		
4.1.5.4	XLPE Power Cable, 33kV (from LV side of the Auto transformer to 33kV line bay arrangement)	1	Lot		
4.1.5.5	33 kV Cable Pothead	1	Lot		
4.1.5.6	220 kV HV Cable	1400	mtrs		
	220 kV Termination Bushing Outdoor for Auto connection	7	Nos.		
	220 kV GIS termination	7	Nos.		
4.1.5.7	Cable carriers (trays, conduits, ducts) for routing the HV & LV power, control, instrumentation and communication interface cables.	1	Lot		
4.1.5.8	Power Cable for Filter Plant (Transformer) 3.5CX240 sq.mm. (Armored, PVC Insulated) with suitable termination arrangement all complete	1	Lot		
4.1.5.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.5					
4.1.6	AC and DC Station Supply Installation				
4.1.6.1	400V AC Main Switch Board				
4.1.6.1.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	3	Nos		
4.1.6.1.2	400V Switchgear with Automation Controls, 630A CB and 2 Current Transformers	1	Nos		
4.1.6.1.3	Distribution panel Bus-A, 400V, 3 Phase, 1000A, 20kA for 1Sec. (5) 400A Breakers, (1) Potential Transformer	1	Nos		
4.1.6.1.4	Distribution panel Bus-B, 400V, 3 Phase, 1000A, 20kA for 1Sec. (6) 400A Breakers, (1) Potential Transformer	1	Nos		
4.1.6.2	400V AC Main Lighting Board				
4.1.6.2.1	100KVA Lighting Transformer	2	Nos		
4.1.6.2.2	Distribution panel, 400V, 3 Phase, 4 Wire, 20kA, 1Sec. Bus-A (4) 63A, (1) 400A Breakers, Bus-B (4) 63A, (1) 400A Breakers, Bus-C (5) 63A TIE A-B 400A breaker, TIE B-C 400A Breaker	1	Nos		
4.1.6.3	400V AC Emergency Lighting Distribution Board				
4.1.6.3.1	100 KVA Lighting Transformer	1	Nos		
4.1.6.3.2	Distribution panel Bus-A 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (5) 63A, (1) 400A 4 Pole Breakers, TIE A-B 100A breaker	1	Nos		
4.1.6.3.3	Distribution panel Bus-B 400V, 3 Phase, 4 Wire, 20kA, 1Sec. (3) 63A, (1) 400A 4 Pole Breakers, TIE B-C 100A Breaker	1	Nos		
4.1.6.4	400V AC Distribution Board				
4.1.6.4.1	400V Switchgear with Automation Controls, 1000A CB and 2 Current Transformers	1	Nos		
4.1.6.4.2	400/110V, 50VA, Potential Transformer	3	Nos		
4.1.6.4.3	400/1A Current Transformer, Class 5P20	1	Nos		
4.1.6.4.4	400V Distribution panel Bus-A (1) 400A, (4) 100A, (8) 63A, (2) 32A 4 Pole Breakers, (14) 63A, (8) 32A 2 Pole Breakers TIE A-B 400A Breaker	1	Nos		

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
				US\$	(1)x(3)
				2	
				3	
4.1.6.4.5	400V Distribution panel Bus-B (1) 400A, (3) 100A, (8) 63A 4 Pole Breakers (14) 63A, (5) 32A 4 Pole Breakers	1	Nos		
4.1.6.5	400V AC AMF Panel				
4.1.6.5.1	400/1A Current Transformer, Class 1	3	Nos		
4.1.6.5.2	400/1A Current Transformer, Class 5P20	1	Nos		
4.1.6.6	DC Chargers and Batteries				
4.1.6.6.1	220V Battery Charger (Float/Boost)	3	Nos		
4.1.6.6.2	48V Battery charger (Float/Boost)	3	Nos		
4.1.6.6.3	250A Throw over Switch, Interlock	6	Nos		
4.1.6.6.4	Battery, 220Vdc, 108 Minimum Cells	2	Nos		
4.1.6.6.5	Battery, 48Vdc, 24 Minimum Cells	2	Nos		
4.1.6.7	DC Distribution Boards				
4.1.6.7.1	Distribution panel, 220V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
4.1.6.7.2	Distribution panel, 48V, 400A, 4kA for 1 Sec. 50 positions	2	Nos		
4.1.6.7.3	DC Fuse Box, 220Vdc	1	Lot		
4.1.6.7.4	DC Fuse Box, 48Vdc	1	Lot		
4.1.6.8	Other Equipment				
4.1.6.8.1	Diesel Generator Set, 250kVA (Including Full Tank)	1	Nos		
4.1.6.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.6					
4.1.7	400 kV Gas Insulated Switchgear (1-1/2 breaker arrangement)				
4.1.7.1	Line/feeder Bay				
4.1.7.1.1	SF6 Circuit Breaker, 400kV, 4000A, 50kA, Three Pole	8	Nos		
4.1.7.1.2	Current Transformer Modules, three cores, 400kV, single-phase, Three-phase set	16	Nos		
4.1.7.1.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	16	Nos		
4.1.7.1.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	16	Nos		
4.1.7.1.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, single-phase, three-phase set	8	Nos		
4.1.7.1.6	Voltage Transformers, 400kV, dual secondary, with earthing link, Single-phase, Three-phase set	8	Nos		
4.1.7.1.7	Line/Feeder Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	8	Nos		
4.1.7.1.8	Line/Feeder Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	8	Nos		
4.1.7.1.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	8	Nos		
4.1.7.1.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	8	Nos		
4.1.7.1.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.1.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.1.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.1.14	Gas Insulated bus (GIB) and required supports for GIB run for whole Line/Feeder Bay Lot	8	Bays		
4.1.7.2	Transformer bay				
4.1.7.2.1	SF6 Circuit Breakers, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	4	Nos		
4.1.7.2.2	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	8	Nos		
4.1.7.2.3	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	8	Nos		
4.1.7.2.4	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	8	Nos		

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				US\$	(1)x(3)
				2	3
4.1.7.2.5	Line/Feeder High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	3	Nos		
4.1.7.2.6	Voltage Transformers, 400kV, dual secondary, with earthing link, single-phase, three-phase set	3	Nos		
4.1.7.2.7	Transformer Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	6	Nos		
4.1.7.2.8	Transformer Maintenance Earthing Switches, 400kV, 50kA, single-phase, three-phase set	6	Nos		
4.1.7.2.9	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	4	Nos		
4.1.7.2.10	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	4	Nos		
4.1.7.2.11	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.2.12	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.2.13	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.2.14	Isolating & Earthing Switches, 400kV, 4000A, 50kA Single phase, and Gas Insulated Bus (GIB) for Spare Transformer, with auxiliary Buses to AIS Bushing termination, jumpers, required CT, Al. tube, metering, control and protection as required all complete. 33kV isolators, 33kV cables , jumpers as required all complete	3	Nos		
4.1.7.2.15	Gas Insulated bus (GIB) and required supports for GIB run for whole Transformer Bay Lot	4	Bays		
4.1.7.3	Diameter Middle Breaker Bay-400 kV				
4.1.7.3.1	Proposed SF6 Diameter middle Circuit Breakers associated with Line Feeder, 400kV, 4000A, 50kA, three-pole	3	Nos		
4.1.7.3.2	Proposed SF6 Diameter middle Circuit Breakers associated with Auto Transformer and Line Feeder, 400kV, 4000A, 50kA, three-pole, with Control Point on Wave Switching Device	2	Nos		
4.1.7.3.3	Current Transformer Modules, Three cores, 400kV, Single-phase, Three-phase set	10	Nos		
4.1.7.3.4	Circuit Breaker Isolating Disconnect Switches, 400kV, 4000A, 50kA, single-phase, three-phase set	10	Nos		
4.1.7.3.5	Circuit Breaker Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	10	Nos		
4.1.7.3.6	Bay Local Control Cabinet including (device controls, instrumentation, interlocking, annunciation, gas density monitoring, circuit breaker monitoring)	5	Nos		
4.1.7.3.7	Partial Discharge Monitoring System including monitoring sensors and diagnostic equipment (per bay)	5	Nos		
4.1.7.3.8	LV control and power cable connections from Local Control Cabinet to all GIS equipment/devices	1	Lot		
4.1.7.3.9	All metallic structures and supports required for GIS complete with accessories	1	Lot		
4.1.7.3.10	All walkways, platforms, stairs, ladders and accessories required for access to all GIS devices	1	Lot		
4.1.7.4	Gas Insulated BUSBAR				
4.1.7.4.1	400kV , 3 single phase (isolated), SF6 gas insulated , metal enclosed 4000A bus bars each enclosed in three individual bus enclosures	6	Diameter		
4.1.7.4.2	Disconnect Switches, 400kV, 4000A, 50kA, Single-phase, Three-phase set	2	Nos		
4.1.7.4.3	Voltage Transformers, 400kV, dual secondary, single-phase, three-phase set	2	Nos		
4.1.7.4.4	Main Bus Bar High Speed Earthing Switches, with removable earthing link 400kV, 50kA, Single-phase, Three-phase set	2	Nos		

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
				US\$	(1)x(3)
4.1.7.4.5	Maintenance Earthing Switches, 400kV, 50kA, Single-phase, Three-phase set	2	Nos		
4.1.7.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.7					
4.1.8	Complete with control & protection up to GIB sealing end for all Feeder and Transformer Bays.				
4.1.8.1	Installation of Control and Protection panels for 400 kV station as specified in Scope and Employers Requirements including but not limited to:				
4.1.8.1.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	17	Nos		
4.1.8.1.2	Line Protection Panel (Note: line protection should include tele protection terminals)	8	Nos		
4.1.8.1.3	Transformer Protection Panel (Auto Trans Bay 1=1no,Auto Trans Bay 2=1no)	4	Nos		
4.1.8.1.4	400kV (Duplicate Bus Bar Protection)	2	Set		
4.1.8.1.5	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.8.2	Installation of Control and Protection panels for 33 kV station as specified in Scope and Employers Requirements including but not limited to:				
4.1.8.2.1	Circuit Breaker Relay Panel (Note: BCU should be included in the Relay Panel)	2	Nos		
4.1.8.2.2	Transformer Protection Panel	2	Nos		
4.1.8.2.3	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
4.1.8.3	Installation of Substation Automation & Metering				
4.1.8.3.1	SAS Operator Station for control of 400/220/33 kV	1	Set		
4.1.8.3.2	Substation Automation System (SAS) for 400 kV System per diameter	6	Set		
4.1.8.3.3	Substation Automation System (SAS) for 33kV System per feeder	2	Set		
4.1.8.3.4	Substation Automation System (SAS) for Auxiliary System	1	Set		
4.1.8.3.5	Integration of all 400kV Bays under present scope with the SCADA of SIEMENS (SINAUT Spectrum) at Load Dispatch Centre, Kathmandu including supply of Hardware, Software, accessories etc. complete as per Technical Specification.	1	Lot		
4.1.8.3.6	Telecommunication system for New Damauli	1	Lot		
4.1.8.3.7	400 kV Metering	1	Lot		
4.1.8.3.8	Fibre Optic SDH System	1	Lot		
4.1.8.3.9	Phone System	1	Lot		
4.1.8.3.10	Miscellaneous Relay and Control Equipment, not included above	1	Lot		
Sub Total 4.1.8					
4.1.9	Grounding System				
4.1.9.1	Stranded Bare Copper 240 Sq. mm Grid (Including Fusion and Mechanical Connectors)	1	Lot		
4.1.9.2	Grounding Rods	1	Lot		
4.1.9.3	Embedded Grounding System - 400kV and 220kV GIS (Including Connections to GIS metallic Structures, Supports and Walkways/Platforms)	1	Lot		
4.1.9.4	Embedded Grounding System - Control room	1	Lot		
4.1.9.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.1.9					
4.1.10	Lightning Protection System				
4.1.10.1	Overhead Galvanized Steel Wire, Including Hardware	1	Lot		
4.1.10.2	Lightening Mast for Protection	1	Lot		
4.1.10.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.10					
4.1.11	Firefighting System				

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Item no.	Description	Qty	Unit	Unit Rate in	Amount in US\$
				US\$	(1)x(3)
				2	
				3	
4.1.11.1	Fire protection/detection for 7 (Seven) auto transformers	1	Lot		
4.1.11.2	Fire protection/detection for 400kV GIS Building	1	Lot		
4.1.11.3	Fire protection/detection for Control House	1	Lot		
4.1.11.4	Fire protection/detection system for pump house building	1	Lot		
4.1.11.5	Fire protection/detection system for generator diesel tank	1	Lot		
4.1.11.6	Portable fire extinguishers	1	Lot		
4.1.11.7	Clean-agent fire extinguishers	1	Lot		
4.1.11.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.11					
4.1.12	HVAC And Ventilation Systems				
4.1.12.1	400kV GIS Building HVAC and Ventilation Systems	1	Lot		
4.1.12.2	Control House HVAC and Ventilation Systems	1	Lot		
Sub-Total 4.1.12					
4.1.13	Accessories and Ancillary Material				
4.1.13.1	Junction and marshalling boxes, outdoor	1	Lot		
4.1.13.2	Junction and marshalling boxes, indoor	1	Lot		
4.1.13.3	Outdoor lighting, including lighting fixtures	1	Lot		
4.1.13.4	Indoor lighting, including lighting fixtures	1	Lot		
4.1.13.5	Control Cabinet for outdoor lighting	1	Lot		
4.1.13.6	Electric Overhead Travelling Crane for installation and removal of GIS Equipment	1	Lot		
4.1.13.7	Rail tracks for movement of power transformers on the reinforced concrete foundations all complete.	1	Lot		
4.1.13.8	Visual Monitoring System	1	Lot		
4.1.13.9	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub-Total 4.1.13					
Total(Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Schedule No. 4.2 : Breakdown of Earthworks

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
4.2.1	Site Clearing, Including Removal of Trees and Stumps	1	Lot		
4.2.2	Top Soil Stripping	1	Lot		
4.2.3	General Excavation	1	Lot		
4.2.4	Compacted Back Fill	1	Lot		
4.2.5	Uncompact Back Fill	1	Lot		
4.2.6	Surplus Disposal	1	Lot		
4.2.7	Surface Works, Including Compaction/Consolidation	1	Lot		
4.2.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Total(Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Schedule No. 4.3 : Breakdown of Civil Works

Item no.	Description	Qty	Unit	Unit Rate in US\$	Amount in US\$
			2	3	(1)x(3)
4.3.1	Foundations				
4.3.1.1	Foundations of 400 kV Gantries	5	Nos		
4.3.1.2	Foundations of 400 kV Capacitor Voltage Transformers & Tank Type Current Transformers	12	Nos		
4.3.1.3	Foundation of 400 kV Surge Arrestor	12	Nos		
4.3.1.4	Foundations of 400 kV Post Type Insulator Bus Support	1	Lot		
4.3.1.5	Foundation, Oil Containment, and Sump Pit For 400/220kV 167 MVA Single Phase Autotransformer	7	Nos		
4.3.1.6	Autotransformer 22kg/m Railway System (22kg/m Steel Rails, Rail Ties, Elastomeric Pad, Screws, Baseplate, and Rail Clamps)	7	Nos		
4.3.1.7	Firewalls Between Auto Transformers	8	Nos		
4.3.1.8	Foundation for 400kV GIB Bus Runs to AIS Equipment	1	Lot		
4.3.1.9	Foundation of 33kV Post Type Insulator Bus Support	1	Lot		
4.3.1.10	Foundation of Station Service Transformer	2	Nos		
4.3.1.11	Foundation of 72.5kV Circuit Breaker	6	Nos		
4.3.1.12	Foundation of 72.5kV Current Transformer	6	Nos		
4.3.1.13	Foundation of 72.5kV Single Phase Switches	1	Lot		
4.3.1.14	Foundation of Diesel Generator Set & Fuel Tank	1	Lot		
4.3.1.15	Foundation of 30kV,10kA Lightning arrester for line bays	6	Nos		
4.3.1.16	Foundations of 30kV,10kA Lightning arrester for 33/0.4kV station service transformers	6	Nos		
4.3.1.17	Foundation for Lightning Mast as required for total protection of equipment	1	Lot		
4.3.1.18	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.1					
4.3.2	External Works and Landscaping				
4.3.2.1	Improvement of Access Road as required to Substation	1	Lot		
4.3.2.2	Internal Paving	1	Lot		
4.3.2.3	Landscaping, Including Maintenance up to Taking Over	1	Lot		
4.3.2.4	Construction of reinforced concrete trenches/duct banks with manholes for all types of HV/MV power and control cables between switchgear building, substation control building and Autotransformer and all substation equipment as specified in Scope and Employers Requirements.	1			
4.3.2.5	Anti-weed treatment & stone spreading along with cement concrete layer, Internal drainage system, external drainage system and Sewage handling as per the Employer's requirements.	1	Lot		
4.3.2.6	Superficial storm drainage system to drain water outside substation during heavy rainfall	1	Lot		
4.3.2.7	River Protection Works and Retaining Wall.	1	Lot		
4.3.2.8	Parking Areas	1	Lot		
4.3.2.9	Guard House	1	Lot		
4.3.2.10	Substation Perimeter Fence	1	Lot		
4.3.2.11	Rain Water Harvesting as per the Employer's requirements.	1	Lot		
4.3.2.12	Firefighting Pump House and Water Tank	1	Lot		
4.3.2.13	Security Lighting along the Fence and Inside the Perimeter	1	Lot		
4.3.2.14	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.2					
4.3.3	General				

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Schedule No. 4.3 : Breakdown of Civil Works

Item no.	Description	Qty	Unit	Unit Rate in US\$	Amount in US\$
			2	3	(1)x(3)
4.3.3.1	Mobilization & Demobilization, Site Infrastructure, Temporary Works at site related to site activities.	1	Lot		
4.3.3.2	Final Cleanup (Including Removal of Excess Materials and Temporary Works) Demobilization	1	Lot		
4.3.3.3	Supply and Installation of Water Supply System as per the Employer's requirements				
4.3.3.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.3					
4.3.4	Substation Buildings				
4.3.4.1	Substation Control Building	1	Lot		
4.3.4.2	400kV GIS Building	1	Lot		
4.3.4.3	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
Sub Total 4.3.4					
Total(Carried forward to SC-4)					
Name of Bidder:					
Signature of Bidder:					

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Summary of Breakdown for Schedule 4.4 Day work

Description	Amount in US\$
1. Sub-Total for Day work: Labor (4.4.1)	
2. Sub-Total for Day work: Materials (4.4.2)	
3. Sub-Total for Day work: Contractor's Equipment (4.4.3)	
TOTAL (to be carried forward to Schedule 4.0)	
Name of Bidder:	
Signature of Bidder:	

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Schedule No. 4.4.1 : Breakdown of Day work Rates: Labor

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
4.4.1	Supervision and Labor				
4.4.1.1	Engineer	350	h		
4.4.1.2	Foreman	400	h		
4.4.1.3	Surveyor	150	h		
4.4.1.4	Technician	600	h		
4.4.1.5	Skilled laborer	600	h		
4.4.1.6	Semiskilled laborer	600	h		
4.4.1.7	Unskilled laborer	600	h		
4.4.1.8	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)		specify		
Total(Carried forward to SC-4.4)					
Name of Bidder:					
Signature of Bidder:					

Note: The labor rate should include all cost needed to provide the Labor at required place including all related cost for providing the labour, ensuring that the labor is qualified for his/her job and can perform the required task professionally.

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Schedule No. 4.4.2 : Breakdown of Day work Rates: Materials

Item no.	Description	Qty.	Unit	Unit Rate in US\$	Amount in US\$
4.4.2.1	Concrete Work				
4.4.2.1.1	Lean Concrete	50	m3		
4.4.2.1.2	Concrete to foundation	150	m3		
4.4.2.1.3	Concrete to superstructure	200	m3		
4.4.2.2	Steel Reinforcement				
4.4.2.2.1	Mild Steel reinforcement, including cutting, bending	10	t		
4.4.2.2.2	High tensile steel reinforcement, including cutting, bending	25	t		
4.4.2.3	Structural Steel				
4.4.2.3.1	Commercial sections, including cutting, welding, bolting	10	t		
4.4.2.4	Excavation Work				
4.4.2.4.1	Excavation in rock (type R), including shoring, backfill, haul and disposal	200	m3		
4.4.2.4.2	Ditto, in soil (type MB and LB)	400	m3		
4.4.2.5	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)				
4.4.2.6	Price for Control Point on Wave Switching Device (CPWSD) to be installed on 400kV Breaker supplied as per Schedule-2	1	No		
4.4.2.7	Price for Pre-Insertion Resistor (PIR) to be installed on 400kV Breaker supplied as per schedule-2	1	No		
4.4.2.8	Price for Stub-Bus Differential Protection for 400kV Future Bay	1	No		
Total(Carried forward to SC-4.4)					
Name of Bidder:					
Signature of Bidder:					

Note: Quoted Unit Price shall include all the cost required to perform task successfully such as loading, transportation, insurance, unloading, cutting (if required), placing as per intended required task, while insuring the quality of the material and health and safety, storing at proper storage place with security and carrying out works as per Employer's requirement and Conditions of Contract.

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Schedule No. 4.4.3 : Breakdown of Day work Rates: Contractor's Equipment

Item no.	Description	Nominal quantity (hours)	Unit	Basic hourly rental rate	Amount
4.4.3	Contractors' Equipment				
4.4.3.1	Concrete Mixer, up to 5 m ³ /h	20	h		
4.4.3.2	Concrete Mixer, above to 5 m ³ /h	20	h		
4.4.3.3	Concrete Pump (Self-Propelled) up to 20 m ³ /h	40	h		
4.4.3.4	Concrete Pump (Self-Propelled) above to 20 m ³ /h	40	h		
4.4.3.5	Concrete batch plant, up to 20 m ³ /h	20	h		
4.4.3.6	Concrete batch plant, above 20 m ³ /h	20	h		
4.4.3.7	Transit mixer, up to 5 m ³	40	h		
4.4.3.8	Transit mixer, above to 5 m ³	40	h		
4.4.3.9	Bulldozer, with ripper, up to CAT D8 class	50	h		
4.4.3.10	Bulldozer, with ripper, above to CAT D8 class	50	h		
4.4.3.11	Track loader, up CAT 953 class	30	h		
4.4.3.12	Track loader, above CAT 953 class	50	h		
4.4.3.13	Wheel loader, up to CAT 930 class	50	h		
4.4.3.14	Wheel loader, above CAT 930 class	50	h		
4.4.3.15	Track excavator	100	h		
4.4.3.16	Air Compressor	100	h		
4.4.3.17	Mobile crane, up to 10 t	50	h		
4.4.3.18	Mobile crane, above 10 t, up to 20 t	50	h		
4.4.3.19	Mobile crane, above 20 t	50	h		
4.4.3.20	Lorry, up to 10 t	100	h		
4.4.3.21	Lorry, above 10 t	100	h		
4.4.3.22	Tipper, up to 10 t	100	h		
4.4.3.23	Tipper, above 10 t	100	h		
4.4.3.24	Pick-up	200	h		
4.4.3.25	Diesel generator, up to 100 kW	100	h		
4.4.3.26	Diesel generator, above 100 kW, up to 250 kW	100	h		
4.4.3.27	Diesel generator, above 250 kW	100	h		
4.4.3.28	Welding Set, Including Welding Rods	300	h		
Total(Carried forward to SC-4.4)					
Name of Bidder:					
Signature of Bidder:					
Note:					

The Basic Hourly rates includes all cost that require to run and perform the task, such as Equipment rental with operator, maintenance of vehicle, running responsibility, health and safety protection, petrol, diesel, lubricants, driver, assistance etc. required for carrying the task with the equipment.

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Schedule No. 4.5 : Other Installation Services

Item no.	Description	Unit	Quantity	Unit Rate in US\$	Amount in US\$
4.5.1	Environmental, Social, Health and Safety Management Plan				
4.5.1.1	General Mitigation Measures				
4.5.1.1.1	Develop a detailed Environmental, Social, Health, and Safety (ESHS) Management Plan for Contractor's employees.	1	Lot		
4.5.1.1.2	Develop, provide training and enforce a Worker Code of Conduct that includes an anti-sexual harassment policy	1	Lot		
4.5.1.1.3	Conduct Employee Induction Training on H&S and environmental/social/cultural sensitivity	1	Lot		
4.5.1.1.4	Implement Community Grievance Redress Plan	1	Lot		
4.5.1.1.5	Personal Protection equipment all complete (Safety Boots, Reflection Jackets, Safety Helmet, Safety Goggles, Safety Mask, Safety earplugs, Safety hand gloves etc.)	1	Lot		
Sub Total 4.5.1.1					
4.5.1.2	Physical Environment Mitigation Measures				
4.5.1.2.1	Implement an Erosion and Sediment Control Plan	1	Lot		
4.5.1.2.2	Manage excavated soils	1	Lot		
4.5.1.2.3	Spray disturbed areas with water if substantive off-site fugitive dust impacts occur	1	Lot		
4.5.1.2.4	Provide a pit toilet and bury all organic wastes at tower construction sites	1	Lot		
4.5.1.2.5	Install septic systems/package and proper wastewater disposal system for workers	1	Lot		
4.5.1.2.6	Provide hazardous material training to concerned staff	1	Lot		
4.5.1.2.7	Stockpile materials for use in controlling spills	1	Lot		
4.5.1.2.8	Provide secondary containment for any fuel or hazardous materials	1	Lot		
4.5.1.2.9	Collect and segregate all waste for reuse, recycle, or disposal	1	Lot		
4.5.1.2.10	Dispose of solid waste at approved waste disposal facilities	1	Lot		
Sub Total 4.5.1.2					
4.5.1.3	Socio-economic and Cultural Environment Mitigation Measures				
4.5.1.3.1	Implement Workforce Management Plan	1	Lot		
4.5.1.3.2	Implement Worker Access Management Protocol	1	Lot		
4.5.1.3.3	Implement Traffic Management Plan and maintain the damaged roads caused by contractors	1	Lot		
4.5.1.3.4	Develop and Implement Worker Grievance Redress Mechanism	1	Lot		
4.5.1.3.5	Conduct community training on EMF risks	1	Lot		
Sub Total 4.5.1.3					
4.5.1.4	Gender, Social Inclusion and Counter-TIP Measures				
4.5.1.4.1	Develop and implement Anti-Sexual Harassment Policy, provide orientation to the entire workers	Lot	1		
4.5.1.4.2	Conduct awareness raising and community meetings to encourage women, socially excluded, historically marginalized, vulnerable groups to apply for jobs	Lot	1		
4.5.1.4.3	Develop and Implement TIP Risk Management Plan	Lot	1		
4.5.1.4.4	Training to the Contractor's employees/staff on Gender and Social Inclusion, prevention on sexual harassment, gender-based violence, child labor and TIP	Lot	1		
4.5.1.4.5	Community TIP risk prevention sensitization and community consultation	Lot	1		
4.5.1.4.6	Community Grievance Redress Plan must have system of Anonymous reporting for TIP suspected cases	Lot	1		
Sub Total 4.5.1.4					

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Schedule No. 4.5 : Other Installation Services

Item no.	Description	Unit	Quantity	Unit Rate in US\$	Amount in US\$
4.5.2	Testing And Commissioning				
4.5.2.1	Site Testing and Commissioning of HV AIS Equipment	1	Lot		
4.5.2.2	Site Testing and Commissioning of Power Autotransformers	1	Lot		
4.5.2.3	Site Testing and Commissioning of 400kV GIS Equipment	1	Lot		
4.5.2.4	Site Testing and Commissioning of Electrical Auxiliary Service Equipment and Power MV and LV Cables	1	Lot		
4.5.2.5	Site Testing and Commissioning of Mechanical Auxiliary Service Equipment	1	Lot		
4.5.2.6	One Month Commercial Operation after Commissioning	1	Lot		
4.5.2.7	End to End Test for all points as specified, including Control, Protection & Remote End Modification	1	Lot		
4.5.2.8	Closed loop test of equipment all complete	1	Lot		
4.5.2.9	PQ (Power Quality), Revenue Energy meter and all remaining equipment of S/S	1	Lot		
4.5.2.10	Other necessary works as per Employer's Requirement and Conditions of Contract, if any, not included above (specify)	1	Lot		
				Sub Total 4.5.2	
4.5.3	Training and O&M Assistance				
Training at Manufacturers Work					
4.5.3.1	Control & Protection, Substation Automation System an	1	Lot		
4.5.3.2	400 kV GIS Equipment and System (Circuit Breaker, Isc	1	Lot		
Training at Site					
4.5.3.3	Control & Protection (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.4	Substation Automation System including the integration aspect of SCADA (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.5	For 400kV Indoor GIS and Outdoor Switchyard Equipment (CT, CVT, Isolator and Circuit Breaker) Operation and Maintenance. (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.6	Operation and maintenance of Transformers (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.7	AC/DC auxiliaries and mechanical system (Refer PSR Section 3.18.1 for more details)	1	Lot		
4.5.3.8	Training at site for other systems (provide list)	1	Lot		
				Sub Total 4.5.3	
				Total(Carried forward to SC-4)	
Name of Bidder:					
Signature of Bidder:					

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Price Schedule No. 5 : Grand Summary

Item	Description	Total Price in US\$
5.1	Total Schedule No. 1. Design Services	
5.2	Total Schedule No. 2. Plant, and Mandatory Spare Parts Supplied from Abroad	
5.3	Total Schedule No. 3. Plant, and Mandatory Spare Parts Supplied from Within the Employer's Country	
5.4	Total Schedule No. 4. Installation and Other Services including all related Civil Works (Excluding Summary of Breakdown of Day works) (includes SC-4.1, SC-4.2, SC-4.3 and SC-4.5)	
5.5	TOTAL (to Bid Form - Resulting contract Price after correction if any)	
5.6	Output VAT (if applicable)	
5.7	Total including Output VAT (5.5+5.6)	
5.8	Total of Summary of Breakdown of Day works (to bid form) (from item No.4.6 of SC-4)	
5.9	Grand Total Including Day work for Evaluation and Comparison Purpose (5.5+5.8)	
Name of Bidder:		
Signature of Bidder:		
Note:		
<i>Quoted Unit Price shall include all the cost required to perform task successfully such as all resources required to carry out the Work, personnel, material, equipment, loading, transportation, insurance, unloading and storing at proper storage place and carrying out works as per Employer's requirement and Conditions of Contract.</i>		
<i>The purpose of price schedules is to identify the Bid Price which will be used to determine progress payment and the rates can be used to determine the price of any variation to scope. The Bid Price if accepted and included in the Contract shall become Contract Price and the Contract price shall not be adjusted (except as stated under Conditions of Contract under Sub-Clause 13.8) in case any quantity varies. The Price quoted under Price Schedule is as per provision of Employer's Requirements and Conditions of Contract.</i>		

