

## APPENDIX 1

### BILL OF QUANTITIES AND SCHEDULE OF REQUIREMENTS

1. The following tables contain the equipment and the quantities required per substation. The panels shall provide protection in accordance with the function allocated to it in column 8 of the table. The details of protection requirements for each panel function are listed in clause 9.0 of specification.
  
2. Definitions of the abbreviations used:
  - XFR – Transformer
  - Xmission Line – Transmission Line
  - O/C – Overcurrent
  - E/F – Earth Fault.
  - CB – Circuit Breaker
  - CT – Current Transformer
  - VT – Voltage Transformer
  - E/L – Earth Leakage
  - Intertripping – Primary-Secondary Intertripping of Breakers
  - MV – Medium Voltage
  - R/P—Reverse Power
  - F/L –Frame Leakage

**X** – The item is needed and shall be included in 'pricing'.
  
4. The tenderers shall fill in the prices for each panel in the columns provided (labour, equipment/material and total). The prices set out against each item in the schedule hereunder shall be the total cost per item for the design, supply, installation and guarantee. Prices must exclude VAT.

APPENDIX 1

**SUBSTATIONS**

**VRYHEID DEPOT**

Substation Name: DUBULA	Space:	Sub MV rating 11 kV	Clearance OK				Other Protection Requirements	Functions (refer to clause 9.0)	Labour	Equipment	Total
CB/Panel number + Designation	kWh Meter	Voltmeter	Differential Protection	Buchholz & Oil Temp	CT Ratio	R/ P & F/L	Transmission Line				
E 01 Transmission Line		X		X	100/1						
Transformer Cable 60m											
								<b>SUB TOTAL (1) =</b>			

	Quantity	Unit	Labour	Equipment	Total
Preliminary and General	1	Complete			
Dismantling and Transporting old equipment	1	Complete			
Checker plates (0.5m <sup>2</sup> / panel)	1 Panel	Complete			
Remote Control Pendant	1	Complete			
Earthing (Complete/sub)	1	Complete			
			<b>SUB TOTAL (2) =</b>		

<b>TOTAL FOR DUBULA (1+2) =</b>	
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**APPENDIX 1**

**SUBSTATIONS**  
**VRYHEID DEPOT (Cont.)**

Substation: HLUNGWANA	Space:	Sub System Voltage 11 kV	Clearance OK			Other Protection Requirements	Functions (refer to clause 9.0)	Labour	Equipment	Total
CB/Panel number + Designation	kWh Meter	Voltmeter	Differential Protection	Buchholz & Oil Temp	CT Ratio					
R10 Transformer	X	X			75/5	R/P and F/L	Incomer			
R11 Widrand							Transmission line			
R12 Vryheid East							Transmission line			
<b>SUB TOTAL (1) =</b>										

	Quantity	Unit	Labour	Equipment	Total
Preliminary and General	1	Complete			
Dismantling and Transporting old equipment	1	Complete			
Checker plates (0.5m <sup>2</sup> / panel)	3 Panels	Complete			
Remote Control Pendant	1	Complete			
Earthing (Complete/sub)	1	Complete			
Training to cover all Vryheid Depot sites		Complete			
<b>SUB TOTAL (2) =</b>					

<b>TOTAL FOR HLUNGWANA SUB (1+2) =</b>	

## APPENDIX 2

**Table 1: TOTAL PRICE**

Vryheid Depot Total	R
Appendix 2 Total (Table 1 only)	R
Contingency (10%)	R
<b>Total=</b>	<b>R</b>

NB: A contingency value of 10% of tender amount shall be included in table 1 above. This shall be included in the contract value but may only be used at the discretion of the Project Manager.

**Table 2: UNIT RATE FOR AN ALTERNATIVE SWITCHGEAR PANEL**

No.	Panel Function	Unit Price
1.0	Transformer (with Buchholz and Over-Temp)	
2.0	Transmission Line	
3.0	Bus-Section	
4.0	Ring Cable (with Pilot Wire Differential Relay)	
5.0	Radial Cable (O/C and E/F – IDMT Relay)	

**Table 3: RATES**

No.	Item	Unit	Rates	
			Labour	Equipment
1.0	Auto Reclosing system (per Xmission line panel)	Each		
2.0	Primary-Secondary Intertripping of Breakers	Each		
3.0	Transformer Cables/Feeders (11kV ) (500 kVA)	Metre		
4.0	Differential Protection	Each		
5.0	O/C and E/F – IDMT Relay	Each		
6.0	Phase Failure Protection	Each		
7.0	Directional O/C and E/F Relay	Each		
8.0	Reverse Power Protection Relay	Each		
9.0	Energy Meter	Each		
10.0	Voltage Transformer– 11kV/110V	Each		
10.1	Voltage Transformer–Dual Ratio(11-6.6kV/110V)	Each		
10.2	Voltage Transformer Selection relay	Each		
11.0.	Voltmeter	Each		
12.0	Trench Earthing	Complete		