

TOTAL AND IMPORTED CONTENT - TABLE 2

Container Corridor

A - TOTALS	
Georgedale Total	
Umbulwana Total	
Stillwater Total	
Hattingspruit Total	
Dannhauser Total	
Alcockspruit Total	
Vooruitsig Total	
Kroomdraai Total	
Val Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rates	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Cleaning/Sreening of existing crusher stones and putting them back	Per Substation		
2	Cast foundation for primary surge arresters	Per Substation		
3	Supply and Install new steelwork for primary surge arresters	Per Substation		
4	Soil rehabilitation around transformer	Per Substation		
5	Supply and Install 88kV Oil Impregnated Paper transformer bushings	each		

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	GEORGEDALE SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment including existing current transformer steel structure	sum				1			
4.0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Primary Surge Arrestors								
1.1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
2.0	Main Current Transformers								
2.1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		2			
2.2	Cast new foundations, supply and install new lattice structure to mount the new CT's	each	Steel	100%		2			
3.0	Cabling and Interconnection								
3.1	Supply and install new cabling and interconnections in outdoor yard	sum	Electrical Cables	90%		1			
4.0	Fencing								
4.1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicuit Breaker	m	Steel	100%		12			
4.2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1			
5.0	Substation Buildings Refurbishment(x2)								
5.1	Design, supply and install a steel IBR roof for the building	sum	Steel	100%		2			
5.2	Supply and install the substation's single standard doors	each	Steel	100%		3			
5.3	Supply and install the substation's double standard doors	each	Steel	100%		2			
5.4	Close the two single doors at the back with bricklaying (busbar chamber and battery rooms)	sum	N/A	N/A		1			
5.5	Supply and install standard double door at isolation transformer room	each	Steel	100%		1			
	Other, (Specify)								
	TOTAL OUTDOOR WORK								

* Contractor to determine

C	COMMISSIONING								
1.0	Conduct Site Tests and Commissioning the substation	sum				1			
							GeorgedaleTotal		

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	UMBULWANA SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment	sum				1			
4.0	Transport old equipment to depot	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Outdoor Earthing								
1.1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2.0	AC Earth Leakage								
2.1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		1			
3.0	Main Current Transformers								
3.1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		2			
4.0	Primary Surge Arrestors								
4.1	Supply and install 88kV primary surge arrestors	each	N/A	N/A		3			
5.0	Secondary Surge Arrestors								
5.1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel Substation Structure	100%		3			
6.0	AC Disconnect and earthing switches								
6.1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		1			
7.0	Substation Outdoor Interlocking								
7.1	Supply and install outdoor and indoor equipment interlocking	sum	N/A	N/A		1			
8.0	Fencing								
8.1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		20			
8.2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1			
9.0	Transformer refurbishment work								
9.1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1			
9.2	Clean, treat (rust), oil and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1			
9.3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1			
9.4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2			
9.5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1			
9.6	Supply and install main transformer with Resin Impregnated Paper or Synthetic Primary Bushings	each	Transformer (class 1)	100%		3			
9.7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	90%		1			
9.8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L			
9.9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1			
9.10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1			
9.11	Chemically treat polluted ballast.	sum	N/A	N/A		1			

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	STILLWATER SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment.	sum				1			
4.0	Transport old equipment to depot.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Outdoor Earthing								
1.1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2.0	Main Traction Transformer Primary Bushings								
2.1	Supply and install main traction transformer 88kV primary bushings	each	Transformer (class 1)	100%		3			
3.0	Substation Interlocking								
3.1	Supply and install outdoor equipment interlocking	sum	N/A	N/A		1			
4.0	Main Current Transformers								
4.1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		2			
5.0	Auxilliary Transformer								
5.1	Supply and install 50kVA auxilliary transformer	each	Transformer (class 0)	100%		1			
6.0	Gate Switch and Spark Gap								
6.1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
7.0	AC Disconnect and earthing switches								
7.1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		1			
8.0	Security lighting								
8.1	Supply and install 250W high pressure sodium vapour lamp or alternative in yard(including wiring and light fittings)	sum	Electrical Cables	90%		3			
8.2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
	Other, (Specify)								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1.0	Substation Interlocking								
1.1	Supply and install indoor equipment interlocking system	sum	N/A	N/A		1			
2.0	Positive Isolator								
2.1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
3.0	3kV DC High Speed Circuit Breaker								
3.1	Supply and install trucks, modular cells and high speed circuit breakers with electronic control relays and associated equipment	each	N/A	N/A		2			
3.2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
4.0	Traction Substation Batteries								
4.1	Supply and Install Substation batteries	sum	N/A	N/A		1			

5.0	<u>Wavefilter equipment</u>							
5.1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1		
6.0	<u>3kV DC Traction Rectifier</u>							
6.1	Supply and Install 6MW traction rectifier	each	N/A	N/A		1		
7.0	<u>3kV DC Earth Leakage</u>							
7.1	Supply and Install 3kV DC Earth leakage Protection system	each	N/A	N/A		1		
8.0	<u>AC Primary Circuit Breaker control Panel</u>							
8.1	Supply and Install AC Primary Circuit Breaker Control Panel complete with all protection equipment	each	N/A	N/A		1		
9.0	<u>AC/DC Distribution Panel</u>							
9.1	Supply and Install AC/DC Distribution Panel complete with all necessary protection equipment	each	N/A	N/A		1		
10.0	<u>3kV DC Under Voltage</u>							
10.1	Supply and Install 3kV DC Under-Voltage Relay	each	N/A	N/A		1		
11.0	<u>Cabling and Interconnection</u>							
11.1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1		
12.0	<u>Substation Light and Power Distribution</u>							
12.1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1		
	<i>Other(Specify):</i>							
	TOTAL INDOOR WORK							
D	COMMISSIONING							
1.0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1		
							Stilwater Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	DANNHAUSER SUBSTATION (DOUBLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment including existing current transformer steel structure	sum				1			
4.0	Transport old equipment to Germiston depot scrapyard.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Outdoor Earthing								
1.1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2.0	Primary Surge Arrestors								
2.1	Supply and install primary freestanding 88kV surge arrestors complete with foundations and steel structures on AC disconnect side	each	Steel Substation Structures	100%		6			
3.0	Secondary Surge Arrestors								
3.1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel Substation Structures	100%		6			
4.0	AC Disconnect and earthing switches								
4.1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		2			
5.0	Auxilliary Transformer (unit A & B)								
5.1	Supply and install 50kVA auxilliary transformer	each	Transformer (class 0)	100%		2			
6.0	Main Current Transformers								
6.1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		4			
6.2	Cast new foundations, supply and install new lattice structure to mount the new CT's	each	Steel	100%		4			
7.0	Fencing								
7.1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		52			
7.2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		2			
8.0	AC Earth Leakage								
8.1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		2			
9.0	Main Traction Transformer								
9.1	Supply and Install new 5MVA traction transformer	each	Transformer (Class 1)	80%		2			
9.2	Demolish the existing transformer plinth and cast a new transformer plinth with a bundwall system	each	Steel	100%		2			
9.3	Supply and install PVC mesh grid drain cover to secure the concrete gutter (Bundwall).	each	N/A	N/A		2			
10.0	Gate Switch and Spark Gap								
10.1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
11.0	Security lighting								
11.1	Supply and install 250W high pressure sodium vapour lamp or alternative in yard(including wiring and light fittings)	sum	Electrical Cables	90%		10			
11.2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		6			

12.0	Substation Buildings Refurbishment								
12.1	Supply and install the substation's single standard doors	each	Steel	100%		5			
12.2	Supply and install the substation's double standard doors	each	Steel	100%		1			
	<i>Other, (Specify)</i>								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1.0	3kV DC High Speed Circuit Breaker								
1.1	Supply and install trucks, modular cells and high speed circuit breakers with electronic control relays and associated equipment	each	N/A	N/A		4			
1.2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2.0	Substation Wavefilter Equipment								
2.1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		2			
3.0	Traction Substation Batteries								
3.1	Supply and Install Substation batteries	sum	N/A	N/A		1			
4.0	Substation Light and Power Distribution								
4.1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
5.0	Substation interlocking								
5.1	Supply and install outdoor and indoor equipment mechanical interlocking	sum	N/A	N/A		1			
6.0	Cabling and Interconnection								
6.1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
7.0	Substation Ventilation and Cooling								
7.1	Design, supply and install building ventilation (including battery room ventilation)	sum	Steel	100%		1			
8.0	Automatic Changeover Facility								
8.1	Supply and install automatic changeover facility with cabling and interconnections for the unit A and B auxiliary supply	each	Electrical Cables	90%		1			
	<i>Other, (Specify)</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1.0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Dannhauser Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	ALCOCKSPRUIT SUBSTATION (DOUBLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment including existing current transformer steel structure	sum				1			
4.0	Transport old equipment to Germiston depot scrapyard.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Outdoor Earthing								
1.1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2.0	Primary Surge Arrestors								
2.1	Supply and install primary freestanding 88kV surge arrestors complete with foundations and steel structures on AC disconnect side	each	Steel Substation Structures	100%		6			
3.0	AC Earth Leakage								
3.1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		2			
4.0	Substation interlocking								
4.1	Supply and install outdoor and indoor equipment mechanical interlocking	sum	N/A	N/A		1			
5.0	Secondary Surge Arrestors								
5.1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel Substation Structures	100%		6			
6.0	Main Current Transformers								
6.1	Supply and install outdoor 88kV Current Transformers between primary circuit breaker and secondary surge arrestors	each	N/A	N/A		4			
6.2	Cast new foundations, supply and install new lattice structure to mount the new CT's	each	Steel	100%		4			
7.0	AC Disconnect and earthing switches								
7.1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		2			
8.0	Auxilliary Transformer								
8.1	Supply and install 50kVA auxilliary transformer	each	Transformer (class 0)	100%		2			
9.0	Main Traction Transformer								
9.1	Supply and Install new 5MVA traction transformer	each	Transformer (Class 1)	80%		2			
9.2	Demolish the existing transformer plinth and cast a new transformer plinth with a bundwall system	each	Steel	100%		2			
9.3	Supply and install PVC mesh grid drain cover to secure the concrete gutter (Bundwall).	each	N/A	N/A		2			
10.0	Fencing								
10.1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		44			
10.2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		2			
11.0	Gate Switch and Spark Gap								
11.1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			

12.0	Security lighting								
12.1	Supply and install 250W high pressure sodium vapour lamp or alternative in yard(including wiring and light fittings)	sum	Electrical Cables	90%		10			
12.2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		6			
13.0	Substation Buildings Refurbishment								
13.1	Supply and install the substation's single standard doors	each	Steel	100%		5			
13.2	Supply and install the substation's double standard doors	each	Steel	100%		1			
	<i>Other, (Specify)</i>								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1.0	3kV DC High Speed Circuit Breaker								
1.1	Supply and install trucks, modular cells and high speed circuit breakers with electronic control relays and associated equipment	each	N/A	N/A		4			
1.2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2.0	Substation Wavefilter								
2.1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		2			
3.0	Substation Light and Power Distribution								
3.1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
4.0	Traction Substation Battery Charger								
4.1	Supply and install new battery charger	each	N/A	N/A		1			
5.0	Substation Ventilation and Cooling								
5.1	Design, supply and install building ventilation (including battery room ventilation)	sum	Steel	100%		1			
6.0	Cabling and Interconnection								
6.1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
7.0	Traction Substation Batteries								
7.1	Supply and Install Substation batteries	sum	N/A	N/A		1			
8.0	Automatic Changeover Facility								
8.1	Supply and install automatic changeover facility with cabling and interconnections for the unit A and B auxilliary supply	each	Electrical Cables	90%		1			
	<i>Other, (Specify)</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1.0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Alcockspruit Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	VOORUITSIG SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment.	sum				1			
4.0	Transport old equipment to Germiston depot scrapyard.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Primary Surge Arrestors								
1.1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
2.0	Outdoor Earthing								
2.1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
3.0	Auxilliary Transformer								
3.1	Supply and install 50kVA auxilliary transformer	each	Transformer (class 0)	100%		1			
4.0	Substation interlocking								
4.1	Supply and install outdoor and indoor equipment mechanical interlocking	sum	N/A	N/A		1			
5.0	Fencing								
5.1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Ciccuit Breaker	m	Steel	100%		14			
5.2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1			
6.0	Gate Switch and Spark Gap								
6.1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
7.0	Security lighting								
7.1	Supply and install 250W high pressure sodium vapour lamp or alternative in yard (including wiring and light fittings)	sum	Electrical Cables	90%		3			
7.2	Supply and install a double tube fluoresent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
8.0	Transformer refurbishment work								
8.1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1			
8.2	Clean, treat (rust) and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1			
8.3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1			
8.4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2			
8.5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1			
8.6	Supply and install main transformer with Resin Impregnated Paper or Synthetic Primary Bushings	each	Transformer (class 1)	100%		3			
8.7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	90%		1			
8.8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L			
8.9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1			
8.10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1			
8.11	Chemically treat polluted ballast.	sum	N/A	N/A		1			
8.12	Treat plinth for oil pollution.	sum	N/A	N/A		1			
8.13	Supply and install new insulation under the transformer	sum	Transformer (class 1)	100%		1			
8.14	Generator utilisation	sum	N/A	N/A		1			
8.15	Crane Truck utilisation	sum	N/A	N/A		1			
	Other(Specify):								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1.0	3kV DC Positive Isolator								
1.1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
2.0	Traction Substation Batteries								
2.1	Supply and Install Substation batteries	sum	N/A	N/A		1			
3.0	Substation Light and Power Distribution								
3.1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
4.0	Substation Wavefilter Equipment								
4.1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
5.0	Cabling and Interconnection								
5.1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1.0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Vooruitsig Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	KROOMDRAAI SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment	sum				1			
4.0	Transport old equipment to Germiston depot scrapyard.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	Outdoor Earthing								
1.1	Renew outdoor earthing, crusher stones etc. complete including earthmat renewal	sum	Electrical Cables	90%		1			
2.0	AC Disconnect and earthing switches								
2.1	Supply and install new 88kV AC disconnects complete with steel structure and foundations	sum	Steel Substation Structures	100%		1			
3.0	Substation interlocking								
3.1	Supply and install outdoor and indoor equipment mechanical interlocking	sum	N/A	N/A		1			
4.0	Fencing								
4.1	Supply and install 1.2m high diamond mesh fence between the AC disconnect and Primary Cicut Breaker	m	Steel	100%		14			
4.2	Supply and install 1.2m high diamond mesh gate	each	Steel	100%		1			
4.3	Supply and install 2.4m high steel Clearvu fence complete with foundations and poles	m	Steel	100%		98			
4.4	Supply and Install 2.4m high steel Clearvu fence double gates	each	Steel	100%		2			
4.5	Supply and Install 2.4m high steel Clearvu fence single gates	each	Steel	100%		1			
5.0	AC Earth Leakage								
5.1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		1			
6.0	Auxilliary Transformer								
6.1	Supply and install 50kVA auxilliary transformer	sum	Transformer (class 0)	100%		1			
7.0	Foundation for all steel structures								
7.1	Carefully decomission and remove all equipment with cracked foundations and respective steel structures i.e. Lightning Arrestors, Pimary Circuit Breakers and AC disconnect	sum	N/A	N/A		3			
7.2	Desing, supply and cast new foundations replacing all structures with cracked foundations	sum	N/A	N/A		1			
7.3	Re-install equipment decommissioned in 7.1 above complete with structures onto the newly cast foundations	sum	N/A	N/A		3			
8.0	Transformer refurbishment work								
8.1	Oil sampling, Testing and analysis prior work commencement	sum	Transformer (class 1)	100%		1			
8.2	Clean, treat (rust), oil and re-paint transformer and conservator.	sum	Transformer (class 1)	100%		1			
8.3	Complete re-gasketing of the transformer	sum	Transformer (class 1)	100%		1			
8.4	Supply and replace winding, oil temperature gauges with their probe pockets	each	Transformer (class 1)	100%		2			
8.5	Supply and replace breather & silica gel	sum	Transformer (class 1)	100%		1			
8.6	Supply and install main transformer with Resin Impregnated Paper or Synthetic Primary Bushings	each	Transformer (class 1)	100%		3			

8.7	Supply Aluminium bus bar & flexibles from secondary insulators to wall bushings	sum	Electrical Cables	100%		1		
8.8	Top up transformer with virgin oil (210L)	sum	Transformer (class 1)	100%		210L		
8.9	Oil purification process at 4 passes	sum	Transformer (class 1)	100%		1		
8.10	Repair oil leaks on all other parts of the transformer (If any)	sum	Transformer (class 1)	100%		1		
8.11	Chemically treat polluted ballast.	sum	N/A	N/A		1		
8.12	Treat plinth for oil pollution.	sum	N/A	N/A		1		
8.13	Supply and install new insulation under the transformer	sum	Transformer (class 1)	100%		1		
8.14	Generator utilisation	sum	N/A	N/A		1		
8.15	Crane Truck utilisation	sum	N/A	N/A		1		
9.0	Gate Switch and Spark Gap							
9.1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1		
10.0	Substation Buildings Refurbishment							
10.1	Design, supply and install a steel IBR roof for the building	sum	Steel	100%		1		
11.0	Security lighting							
11.1	Supply and install 250W high pressure sodium vapour lamp or alternative in yard (including wiring and light fittings)	sum	Electrical Cables	90%		3		
11.2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4		
11.0	Primary Surge Arrestors							
11.1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3		
	<i>Other(Specify):</i>							
	TOTAL OUTDOOR WORK							

* Contractor to determine

ItemNo.	Description	Unit				Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1.0	Positive Isolator								
1.1	Supply and Install Positive Isolator and Earth Switch	each	N/A	N/A		1			
2.0	Substation Light and Power Distribution								
2.1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
3.0	Substation Wavefilter Equipment								
3.1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
4.0	Cabling and Interconnection								
4.1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
5.0	3kV DC Under Voltage								
5.1	Supply and Install 3kV DC Under-Voltage Relay	each	N/A	N/A		1			
10.0	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1.0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Kroomdraai Total	

* Contractor to determine

BILL OF QUANTITIES

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
	VAL SUBSTATION (SINGLE UNIT)								
A	GENERAL								
1.0	Preliminary and General /Site Establishment.	sum				1			
2.0	The contractor shall provide three sets of drawings and manuals and an electronic version in accordance with CEE0224.	sum				1			
3.0	Dismatle/remove old equipment.	sum				1			
4.0	Transport old equipment to Germiston depot scrapyard.	sum				1			
B	OUTDOOR YARD EQUIPMENT								
1.0	AC Earth Leakage								
1.1	Supply and install AC Earth Leakage Protection	each	N/A	N/A		1			
2.0	Gate Switch and Spark Gap								
2.1	Supply and install 450V spark gap and gate switch	sum	N/A	N/A		1			
3.0	Primary Surge Arrestors								
3.1	Supply and install 88kV primary surge arresters	each	N/A	N/A		3			
4.0	Secondary Surge Arrestors								
4.1	Supply and install secondary freestanding 88kV surge arrestors complete with foundations and steel structures on main transformer HV side	each	Steel	100%		3			
5.0	Security lighting								
5.1	Supply and install 250W high pressure sodium vapour lamp or alternative in yard (including wiring and light fittings)	sum	Electrical Cables	90%		3			
5.2	Supply and install a double tube fluorescent light including fittings on the outside of the building wall (all sides)	each	Electrical Cables	90%		4			
6.0	AC Disconnect and earthing switches								
6.1	Supply and install new 88kV AC disconnects	sum	N/A	N/A		1			
	<i>Other(Specify):</i>								
	TOTAL OUTDOOR WORK								

* Contractor to determine

ItemNo.	Description	Unit	Local Content (LC)	LC %	LC	Quantity	Mat./Equip Unit Rates	Labour Unit Rates	Total (Labour + Equipment)
C	INDOOR EQUIPMENT								
1.0	3kV DC High Speed Circuit Breakers								
1.1	Supply and install trucks, modular cells and high speed circuit breakers with electronic control relays and associated equipment	each	N/A	N/A		4			
1.2	Supply and install electronic busbar interlocking system	sum	N/A	N/A		1			
2.0	Traction Substation Batteries								
2.1	Supply and Install Substation Batteries	sum	N/A	N/A		1			
3.0	Substation Light and Power Distribution								
3.1	Supply and install electrical wiring (including indoor and outdoor lighting)	sum	Electrical Cables	90%		1			
4.0	Wavefilter equipment								
4.1	Supply and install Wave filter equipment and necessary interlocking	sum	N/A	N/A		1			
5.0	Cabling and Interconnection								
5.1	Supply and Install new cabling, wiring and interconnections	sum	Electrical Cables	90%		1			
	<i>Other(Specify):</i>								
	TOTAL INDOOR WORK								
D	COMMISSIONING								
1.0	Conduct Site Tests and Commissioning the substation	sum	N/A	N/A		1			
								Val Total	

* Contractor to determine