PROJECT DESCRIPTION: TE NATIONWIDE ELECTRICAL SUBSTATIONS UPGRADE

KOEDOESPOORT (SUBSTATION J)

PROJECT NO: 2537842

ELECTRICAL WORKS: BILL OF QUANTITIES

REV OB

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	INSTALL	TOTAL
1	**EXISTING SUBSTATION EQUIPMENT**					
1.1	**MEDIUM VOLTAGE EQUIPMENT** **This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation philosophy of busbar sections. Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.**					
1.1.1	Allowance for de-energizing and removal of existing 11kV panels; switchgear and associated accessories and return to client (including loading, transportation within a 2km radius; offloading and safe disposal of circuit breaker oil in accordance with Transnet Depot safety and environmental standards). This activity shall be carried out by the contractor in accordance with the proposed method statement regarding switching and isolation of busbar sections inline with the existing Single Line Diagrams.	sum	0			
1.2	**LOW VOLTAGE EQUIPMENT** **Contractor to advise the Project Manager at least four (4) weeks prior to commencing with this item.**					
1.2.1	Allowance for de-energizing; dismantling and removal of existing Low Voltage panels; and return to client.(including loading, transportation within a 2km radius and	sum	1			
1.2.2	Allowance for de-energizing; dismantling and removal of existing Low Voltage cables from the transformers to the new Low Voltage incomers (including loading, transportation within a 2km radius and offloading.)	sum	1			
1.3	**CABLE MANAGEMENT SYTEM** **Allowance for identification and labelling of all the existing cables in the basement room. The cables shall then be neatly ran/installed by the contractor on a new cable ladder support system in accordance with TPD-003-CABLESPEC and TPD-001-EL&PSPEC. The allowance shall include drainage of existing contaminated water, safe erection/dismantling of scaffolding in the basement room and making good thereafter.**					
1.3.1	Removal of the existing cable ladder system. Design, supply and installation of Hot-dip galvanized welded 1000x75mm heavy duty cable ladder system with cable strapping slots in accordance with the typical design on drawing 2537842-5-004-E-LA-0005-02-0A (cable ladders to be supported every 1000mm intervals). The entire cable management system shall be earth bonded in accordance with TPD-004-EARTHSPEC:					
(a)	Straight	m	50			
(b)	Tee	ea.	5			
(c)	Internal bend	ea.	5			
(d)	External bend	ea.	5			
(e)	Horizontal bend	ea.	5			
(f)	1050x2.5mm Double Cantilever Arms	ea.	50			
(g)	Slotted pierced channel	m	200			
(h)	Allowance installation accessories: for M10 Raw bolts, Splices, earth straps and Fasteners	sum	1			
1.3.2	Allowance for dismantling of the existing low voltage transformer termination boxes (only on the Low Voltage Side).	sum	1			
(a)	Design, supply and installation of a new 1000x650x400mm Hot-Dip Galvanized cable termination box. The box shall be securely bolted onto the transformer body without damage the transformer. The box shall be powder coated, electric Orange in colour and with 6mm thick Aluminum gland plate.	ea.	4			

2	**PROPOSED SUBSTATION EQUIPMENT**					
2.1	**MEDIUM VOLTAGE EQUIPMENT** **Supply and Installation shall be carried out in accordance with SANS 10142-2 and Transnet MV Specification TPD-007MVSWITCHSPEC.** **<u>Please note:</u> It is the contractor responsibility to obtain a copy of the Transnet MV Specification and room layouts to ensure the offered equipment can fit in the substation building prior to pricing the works.**					
2.1.1	1250A,11kV Incomer panels, comprising of Current and Voltage transformers, as per specification TPD-007-MVSWITCHSPEC Annexure 1 and drawings 2537842-5-004-E-LA-0005-01-0A and 2537842-5-004-E-LA-0005-02-0A	ea.	0			
2.1.2	630A, 11kV Transformer Feeder panels, comprising of Current and voltage transformers as per specification TPD-007-MVSWITCHSPEC Annexure 1 and drawings 2537842-5-004-E-LA-0005-01-0A and 2537842-5-004-E-LA-0005-02-0A	ea.	0			
2.1.3	630A, 11kV Feeder panels, comprising of Current and voltage transformers as per specification TPD-007-MVSWITCHSPEC Annexure 1 and drawings 2537842-5-004-E-LA-0005-01-0A and 2537842-5-004-E-LA-0005-02-0A	ea.	0			
2.1.4	11kV Bus Coupler panel switchboard, comprising of protection relays, voltage transformers, etc., as per specification TPD-007-MVSWITCHSPEC Annexure 1, drawings 2537842-5-004-E-LA-0005-01-0A and 2537842-5-004-E-LA-0005-02-0A	ea.	0			
2.1.5	Supply and installation of new termination kits. Termination of existing 11kV cables into new 11kV panels.	ea.	0			
2.1.6	Busbar Earth & Voltage Transformer panels as per specification TPD-007-MVSWITCHSPEC	ea.	0			
2.1.7	Bus riser panels as per specification TPD-007-MVSWITCHSPEC	ea.	0			
2.1.8	Supply and Installation of Arc Ducting as per specification TPD-007-MVSWITCHSPEC (Ducting to extract from the switchgear to exterior of substation with suitable weather Hot-Deep galvanized steel cowl)	sum	0			
2.1.9	Supply; installation and commissioning of new 12KV Ring Main Unit comprising of 3 x 630A circuit breakers complete with Voltage indicator; Interlocked internal arc cable boxes and protection relays, equipped with earth fault indicator.	ea.	0			
2.1.10	Supply, installation and commissioning of new 120mm² 3 Core Armoured XLPE insulated PVC sheathed 6.35/11kV cable.	m	0			
2.1.11	Termination of the new 120mm² 3 Core Armoured XLPE insulated PVC sheathed 6.35/11kV cable.	ea.	0			
2.1.12	Provisional allowance amount of One Hundred Thousand rands for MV Cable joints	sum	0			
2.2	**PROTECTION GRADING**					
	Allowance for removal of the existing Solkor relays across the entire 11KV network feeder/incomers and replace with new differential protection relays in accordance with TPD-TPD-007-MVSWITCHSPEC and with similar specifications offered in Annexure 1					
2.2.1	Supply, installation, grading and commissioning of new Differential Protection Relays as shown on drawing 2537842-5-004-E-LA-0005-01-0A and 2537842-5-004-E-LA-0005-02-0A	sum	0			
2.3	**LOW VOLTAGE EQUIPMENT**					
2.3.1	Supply and Installation of new 400V panels comprising of all switchgear and associated equipment as per specification TPD-002-DBSPE; drawings 2537842-5-004-E-LA-0005-03-0A	sum	1			
2.3.2	Supply, Installation and commissioning of new 630mm² Single Core Unarmoured XLPE insulated PVC sheathed 600/1000V cable at existing Transformers termination boxes and Low Voltage incomer panels.	m	200			
2.3.3	Supply, installation and commissioning of new 150mm² Single Core Unarmoured PVC insulated PVC sheathed 600/1000V earth conductor from Transformers to Low Voltage incomer panels.	m	50			
2.3.4	Termination of new 630mm² Single Core Unarmoured XLPE insulated PVC sheathed 600/1000V cable at existing Transformers termination boxes and Low Voltage incomer panels. This is inclusive of glands, lugs and termination accessories.	ea.	32			
2.3.5	Termination of new 150mm² Single Core Unarmoured PVC insulated PVC sheathed 600/1000V earth conductor from Transformers to Low Voltage panel. This is inclusive of glands, lugs and termination accessories.	ea.	8			
2.3.6	Provisional allowance amount of One Hundred Thousand rands for LV Cable joints	sum	1			
3	**MISCELLANEOUS SUBSTATION ITEMS/EQUIPMENT**					
3.1	Tool Rack (wall mounted)					
3.2	VCB trolley (depending on the offered Switchgear)	ea.	0			
3.3	Substation Key Rack - (wooden key rack to accommodate 4 keys with glass window),	ea.	0			

3.4	Allowance for Fasstrap plate to cover ducts around the switchgear panels (including cutting to fit equipment and painting)	sum	1			
3.5	Battery charger (using maintenance-free Ni-Cd batteries) as per specification TPD-007-MVSWITCHSPEC including all cabling and wiring.	ea.	0			
3.6	Wiring for LV/MV inter-tripping	sum	1			
3.7	General safety signage in and out of the substation (To SANS 10142-2 and Transnet Engineering signage specifications)	sum	1			
3.8	Allowance for new floor epoxy, painting and zone demarcation (Green and Yellow)	sum	0			
4	**TESTING AND COMMISSIONING**					
4.1	**MEDIUM VOLTAGE PANELS**					
4.1.1	Allowance for FAT attendance by independent certified protection engineer.	sum	0			
4.1.2	Pre-commissioning tests of 11kV panels by a Certified Engineer specializing in commissioning of MV equipment and protection relays, including a protection study and grading of relays.	sum	0			
4.1.3	Commissioning tests of the 11kV Panels in presence of Client and Transnet engineer, including protection grading and relay settings by a Certified Engineer as per TPD - 007MVSWITCHSPEC and in accordance to SANS 10142-2.	sum	0			
4.1.4	Allowance for testing of the existing earth mat and ensure compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification.	sum	1			
	Allowance for LV panels FAT attended by Transnet Engineer	sum	1			
4.2	**LOW VOLTAGE PANELS**					
4.2.1	Commissioning tests of 400V Panel by a Certified Engineer in presence of Client and consultant, including protection grading and relay settings.(including issuing of COC in accordance to SANS 10142-1)	sum	1			
5	**GENERAL**					
5.1	Removal of existing metering (METERING ONLINE) equipment from existing LV panels and reinstatement onto new panels, including the new metering CT's and wiring as required.	Sum	1			
5.2	Three sets of manuals, software, drawings and test certificates. One sets in plastic sleeves and "as built" of electrical infrastructure in AutoCAD format. (3 OFF)	Sum	1			
5.3	Training (for fifteen people) on basic operation and testing of all new panels.	Sum	1			
6	**EARTHING**					
6.1	Provisional amount of fifty thousand rands for design, supply and installation of earthing and bonding in compliance with TPD-004-EARTHSPEC, Transnet Earthing Specification. Allowance	sum	1			
Subtotal A: To be carried forward to summary						

NOTE: CONTRACTOR TO INSERT REQUIRED P&G ITEMS FOR SUCCESSFUL COMPLETION OF THE WORKS IN TERMS OF ALL CONDITIONS OF

7	**PRELIMINARY AND GENERAL ITEMS**				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**TOTAL COST**
7.1	Office and storage sheds	day			
7.2	Ablution and latrine facilities	day			
7.3	Security	day			
7.4	Tools and equipment	day			
7.5	Site establishment	sum			
7.6	Site de-establishment	sum			
7.7	Safety Compliance	sum			
7.8	Contractual requirements	sum			
Subtotal B: To be carried forward to summary					

7	**SUMMARY OF SCHEDULE OF ELECTRICAL SCHEDULE & RATES**	
7.1	Subtotal A	
7.2	P&Gs	
7.3	10% Contingency (Allowance of a ten percent contingency)	
Total Tender Price		