ANNEXURE 7

ELECTRICAL INFRASTRUCTURE MAINTENANCE SCHEDULE AND INVENTORY

TDR FOR PROVISION OF INTEGRATED FACILITIES MANAGEMENT AT TRANSNET ISANDO, SENTRA RAND AND ELANDSFONTEIN PRECINCT FOR A PERIOD OF 3 YEARS

INVENTORY SUMMARY

#	Item	Qty	Size		
1	**Standby Generators**	1	250 kVA Marelli		
		1	62.5 kVA		
2	**Geysers**	3	150L		
		8	200L		
3	**LV Distribution Boards**	42	10 circuits average per DB		
4	**UPS Boards**	8	5 circuits per board		
5	**Luminaires**	1326	Single to triple lamp		

1. STANDBY GENERATORS

Quantity	
Specification	
Frequency	**Activity**
Oil Inspection	
Monthly	- Check oil level and top up as required - Check oil viscosity for dilution by water or fuel - Repair all oil leaks
Battery Inspection	
Monthly	- Check starter battery terminals and apply contact grease - Check battery cables for damage and secure terminals - Check battery electrolyte - Check battery voltage and record - Check battery voltage drop during engine cranking and record - Check battery charger operation after a cranking test.
Fuel Inspection	
Monthly	- Check level of fuel tank and top up if necessary - Check proper function of fuel pumping - Check bulk fuel tank (If applicable) - Replace all fuel leakages.
Cooling Water Inspection	
Monthly	- Check engine coolant level - Check proper function of cooling water pump - Check proper function of cooling tower fan
Engine and Generator Inspection	

Monthly	- Check engine temperature during operation - Check abnormal engine speed during operation - Check engine synchronising mechanism during operation - Check change-over mechanism during operation - Verify generator alarm functions during operation - Check accumulation of dust on Generator and clean if necessary - Test run generator on load and record voltages, currents and frequency - Clean generator set and switched back into "auto" mode - Check and rectify any loose components
Generator Set Inspection	
12 monthly	- Drain oil sample and submit for analysis to establish need for an odd change - Record output parameters while on load - Record running hours - Service diesel engine and steam clean engine, Generator as well as day tank - Inspect all rubber hoses and wiring, replace if required - So cold starting volt drop test on prime mover starter battery, replace starter battery if required - Clean slip rings and inspect brush gear. Open Generator terminal box, clean and tighten terminations - Check and record earthing valve as measured with resistance measuring instruments - Service change-over switchgear Disassemble contractors and clean test operation - Service alarm panel and clean internally and externally - Simulate and verify alarm and shut down conditions - Replace all inoperative lamps, sirens and meters
Generator Room	
12 Monthly	- Clean plant room and re-lamp luminaires - Seal all sleeves with chicken wire and builders foam. - Provide relevant poison inside cable trenches. - Paint floor with epoxy paint - Check laggings on exhaust system and repair if necessary - Check and fit new padlocking if necessary
Cooling System	
24 Monthly	- Drain cooling system, flush and refill with water and prescribed water conditioner.

2. GEYSERS

Quantity	
Specification	
Frequency	**Activity**
Piping	
Monthly	- Insert water piping and equipment for water leaks and repair leaks

	where required - Safety valves must be flushed to ensure that there is no blockage - Insert pipe work, pipe joints, pipe work insulation and pipe support and rectify where required - Insert valves, steam traps, water gauges, temperature controls sight glasses thermometer etc. for water leaks, and repair where necessary - Flush clean all pipe work to remove any wild scale, stones or other debris which may damage the tank living.
Industrial geysers	
12 Monthly	- Check and ensure that all electrical connections are tight and tighten any loose electrical connections - Drain water from the industrial geysers and check any internal defects and ensure that corrosion protection is still intact - Check and service sacrificial anode thermostat and burnt element after geyser water drainage. Replace all items if required. - Sample and test cold water supply for foreign particles which may damage the geyser systems, purify cold water supply if necessary. - Check and clean electrical control panel and check for correct operation.

3. LOW VOLTAGE DISTRIBUTION BOARDS (DBs)

Quantities	
Frequency	**Activity**
L.V Board	
6 Monthly	- Check DB labelling, danger signs and legend and replace if necessary - Check all electrical are not loose, and tighten if necessary - Check all DB covers are in place, and replace if necessary - Check all DB c overs and locks are in place and replace/repair if necessary - Check all circuit breakers and isolators are operational as per specification, and replace if damaged - Check all DB blank covers are in place and replace if damaged/missing - Check the condition of the busbars and replace if and tighten all loose busbars.
12 Monthly	- Check and replace all damaged cable terminations including cable ferrules and rings - Check paint work and re-paint distribution boards including framework, panels and chassis, if necessary - Check busbars inside distribution boards as far as insulation and clearance distances, creepage distance joints, insulation resistance dielectric strength, deflection test, absorption resistance and short time withstand current on concerned record concerned record values and rectify if necessary. - Check the correct individual circuit breaker continuous current rating, trap routing and rupturing capacity, rectify if necessary - Check and clean all DB circuit breaker contacts with suitable cleaning material - Check and verify circuit breaker operating handle position indication of "ON" "OFF" and TRIP, and rectify if necessary - Check and test LV distribution earthing and provide COCs for distribution board in accordance with SANS 10142 Code of Practice for Wiring of Premises as amended. - Check and test earth leakage unit operation, and replace if necessary - Check and test installed indoor surge arrestors, and replace if necessary.

4. UPS BOARDS

Quantities	
Frequency	**Activity**
UPS Board	
Monthly	- Inspect and repair as required - Load test and repair or replace batteries as required

5. LUMINAIRES

Quantities	
Frequency	**Activity**
Luminaires	
Daily	- Inspect for lamp or luminaire failure and replace lamps as required - Repair luminaires as required

6. MINIMUM STOCK HOLDING

The bidder should, at all times, stock any replacement part necessary for the execution of Works. The principle that applies to stock keeping is that downtime on equipment should be kept to a minimum. Therefore, all consumables that might be necessary for the execution of the works shall be readily available. The bidders should list exclusions, if any, to the above with the maximum time necessary to acquire this spare part.

Item name/ description	**Time to acquire**

7. MINIMUM SPECIAL EQUIPMENT

The bidder should list any special equipment, if any, that might be necessary for the execution of the Works, that will not be, either on site, or at the premises on daily basis. The bidder should indicate the maximum time necessary to acquire this equipment.

Item name/ description	**Time to acquire**

Staffing requirements:

- Electrical maintenance will require a minimum of 4 personnel comprising of 3 multi skilled technical workers and 1x a qualified, multi skilled Plumber (Supervisor or similar skill) to attend to planned, day to day Electrical maintenance, breakdowns, repairs and upgrades.
- It is the responsibility of the bidder to provide tools, PPE, etc for the above staff.

Material:

- Material required for day to day and unplanned maintenance will be sourced under pass through costs as the works cannot be predetermined.