

applicable to the equipment referred to in the table.

PFB 04 STATUS OF EXISTING INSTALLATION

At the time of compilation of this document the status of the existing installation has been noted as follows:

- (a) Some steam leaks exist on the distribution network.
- (b) The steam and condensate reticulation is generally in a good condition.
- (c) Some line trap sets on the distribution network discharge directly into the atmosphere.

NB: The above information must be adjusted according to the project and site requirements.

PFB 05 DETAILS OF REPAIR WORK

The following work shall form part of the repair work to the steam distribution installation. This work shall be done in accordance with the relevant regulations, codes, specifications and Technical Specification FB: Steam Distribution Installations, as set out in this document. The following work shall be included:

PFB 05.01 General

The Contractor shall at the start of the Repair and Maintenance Contract inspect the following items, systems, equipment, components and installations. This inspection shall include the establishing of any defects, leaks, conditions, damages, short falls, structural soundness, repairs required, details of existing equipment, suitability of equipment for the purpose it serves, etc. The Contractor shall report back to the Engineer/Departmental Representative in writing on all of the above and the following items. No repair work shall commence prior to approval by the Engineer/Departmental Representative:

- (a) Main and secondary steam and condensate pipe distribution network including all steam valves, expansion joints, pipe fittings, piping, air release valves, dirt pockets, etc;
- (b) Steam trap arrangements including steam traps, sight glasses, non-return valves, test valves, pipe connections, piping, etc;
- (c) Support and bracketing system to all steam and condensate pipe work;

- (d) Lagging and cladding of steam and condensate pipe work;
- (e) Pressure reducing valve installations;
- (f) Condensate pump installations.

The general scope of work at the time of going on tender is defined as follows:

- (a) Repair of all steam leaks;
- (b) The installation of blow-down valves and piping dirt pockets not equipped with blow-down valves.
- (c) Check, clean and repair condensate pump systems as required.
- (d) The servicing of all equipment including steam trap arrangements, PRV stations, valves, strainers, check-valves, pressure gauges, sight glasses, condensate pump system, control valves, safety valves, etc;
- (e) Flushing out of complete pipe system followed by a pressure test;
- (f) The Contractor shall allow for all required inspections and tests by an approved Inspection Authority on repair work where required by the Occupational Health and Safety Act as amended.
- (g) Preparation and painting of all exposed piping and equipment in accordance with the Department's painting specification;
- (h) The introduction of a maintenance control plan, including logging, recording and control procedures;
- (i) Handing over of complete system to the satisfaction of the Engineer/Departmental Representative on completion of the repair work on which the maintenance period of this contract shall commence.

PFB 05.02 DETAIL WORK

PFB 05.02.01 Steam and condensate pipe reticulation network - Refer to Standard Specification FB clause FB 09

- (a) Repair and replace damaged and missing sections of lagging and cladding to the steam and condensate pipe system as directed by the Engineer/Departmental representative. This shall include new fibre glass pre-formed sections and sheet metal muffs for short runs of piping and fittings. Rates will be as entered in the Schedule of Quantities.
- (b) Clean and blow out all dirt pockets.

- (c) Install 15 mm diameter steam globe valves with plugged end as required to existing plugged dirt pockets on the steam distribution installation. This shall include reducing bush nipples, valves and plugs. Quantities will be as specified in the Schedule of Quantities.
- (d) Clean, service, repair and replace sight glasses to all sight glass units. This shall include gaskets and new glasses.
- (e) Service all steam traps and replace all gaskets, O-rings, seals, strainer elements, buckets, thermostatic elements, valve assemblies, etc, as specified necessary for a full service on the specific steam traps. Quantities will be as specified in the Schedule of Quantities.
- (f) Replace damaged and defective steam traps beyond repair. Quantities will be as specified in the Schedule of Quantities.
- (g) Service, all steam and condensate valves and replace seals, gaskets, and gland packings. Quantities as specified in the Schedule of Quantities.
- (h) Repair steam leaks to steam piping. This shall include cutting, preparing, welding, cleaning, testing and all required fittings and making good of lagging and cladding.
- (i) Blow down all dirt pockets.

PFB 05.02.02 Steam and condensate pipe installation to the calorifier plant installation in the boiler house - Refer to Standard Specification FB clause FB 09

- (a) Decommission, disconnect and dismantle existing steam and condensate pipes to each calorifier in turn, check and repair steam trap sets to each calorifier as required and check for correct operation.
- (b) Service and repair steam and condensate valves and fittings
- (c) Clean, service and repair condensate sight glasses
- (d) Test, commission and hand over the complete steam and condensate steam installation.
- (e) Repair all steam leaks
- (f) Blow down and clean all dirt pockets/drain points
- (g) Repair all damaged lagging and cladding
- (h) Put systems back on line

PFB 05.02.03 Steam and condensate installation to the calorifier plant installations at the single quarters - Refer to Standard Specification FB clause FB 09

- (a) Decommission, disconnect and dismantle existing steam and condensate pipes to each calorifier in turn, check and repair steam trap sets to each calorifier as required and check for correct operation.
- (b) Service and repair steam and condensate valves and fittings
- (c) Clean, service and repair condensate sight glasses
- (d) Test, commission and hand over the complete steam and condensate steam installation.
- (e) Repair all steam leaks
- (f) Blow down and clean all dirt pockets/drain points
- (g) Repair all damaged lagging and cladding
- (h) Put systems back on line

PFB 05.02.04 Steam and condensate installation to laundry - Refer to Standard Specification FB clause FB 09

- (a) Service and repair all steam traps.
- (b) Service and repair safety valve to existing PRV installation.
- (c) Service and repair pressure reducing valves
- (d) Repair and service all steam and condensate valves.
- (e) Service, repair and clean condensate sight glasses
- (f) Blow down all dirt pockets.
- (g) Re-commission and put system back on line.

PFB 05.02.05 Steam and condensate installation to kitchen - Refer to Standard Specification FB clause FB 09

- (a) Service and repair pilot operated PRVs.
- (b) Service and repair all steam traps.
- (c) Service and repair all steam and condensate valves.
- (d) Service, repair and overhaul steam pop-up safety valve.

- (e) Clean out, service, repair sight glasses including replacement of glasses and gaskets.
- (f) Blow down all dirt pockets.
- (g) Re-commission and put system both into operation.

PFB 05.02.06 Condensate pump installations - Refer to Standard Specification FB clause FB 09

- (a) Inspect and report back to the Engineer/Departmental Representative in writing on the condition and status of all the condensate pump installations and their associated equipment.
- (b) Drain, empty, clean out and inspect all condensate tanks for any defects or damages, and report to the Engineer/Department Representative. The Engineer/Department Representative shall inspect these tanks prior to any further work or/and put back into operation.
- (c) Inspect, service, tests and report on the condition and functionality of all level controls.
- (d) Inspect, service and report on electrical condensate pumps including the following as described in FB 09.09.02.
- (e) Inspect, service, test and repair electrical control panels as described in FB 09.11.02.

PFB 05.03 PAINTING

The Contractor shall prepare, clean and paint all steel surfaces and equipment where directed by the Engineer in accordance with Specification OWG 371: Specification of Materials and Methods to be used (Fourth edition, October 1993 or latest edition).

(a) **Condensate Pumps**

Centrifugal pumps suitable for pumping hot, corrosive water are required for pumping condensate.

The required pump flow capacities and heads for each pump is 1.5 litres/sec at a head of approximately 20 - 25 metres.

It is essential that the following items of information be permanently marked on each pump:

- (i) flow capacity (l/sec);
- (ii) Pump head (meters water gauge);
- (iii) Impeller size;
- (iv) Pump speed;
- (v) Required motor power;
- (vi) Make of pump;
- (vii) Model;
- (viii) Date of purchase.

Close coupled pumps/motors are not acceptable.

It is preferred that separate pumps and motors be supplied, mounted on a common rigid steel or cast iron frame.

Pumps must have shrouded impellers and replaceable wear rings. Impellers must be made of bronze or stainless steel and pump shafts must be of type 410 or 415 stainless steel.

Pump glands must be fully accessible without having to remove the motor. Gland packing must be PTFE (Polytetrafluoroethylene) and be readily replaceable.

Pump bearings, if not of the permanently lubricated type must be lubricated from an oil reservoir with sufficient capacity for at least six months operation.

The pump drive and coupling must be protected by a sturdy drive guard.

Pumps must be selected to operate at maximum efficiency. Pump speeds must not exceed 1450 rpm and the installation must be a quiet in operation.

Pumps must be mounted on drip trays neatly piped to the nearest drain point.

Pressure gauges must be fitted to pump discharge pipes. The normal operating pressure must be clearly marked on the dial face.

(b) **Motors**

Electric motors for condensate pump sets must be suitable for duty at ambient temperatures up to 60°C. Motors must be of the totally enclosed, drip proof, fan cooled type with life-time sealed bearings. Furthermore they must comply with the relevant SANS specifications (Latest amendments).

Motor control will be by means of the float/level switch specified in section 6.3 which will activate a direct-on-line starter.

Unless otherwise specified a suitably rated electrical supply will be brought into close proximity of the pump motor by others. The steam Contractor will be required to supply a switchboard containing a suitably rated isolator, circuit breaker, the necessary direct-on-line starter, etc. The steam Contractor will be required to terminate the cable brought in by others in the isolator and make the necessary connections to the motor.

It is essential that the board contains a low voltage release that will isolate the pump on voltage drop below 90% of the rated voltage. A timer is required to delay re-starting of the pump for 2 - 3 minutes after full power is restored. Similarly phase failure protection is required, again with the motor only restarting 2 - 3 minutes after restoration of full power. In both instances the motor must restart automatically.

A manual-auto switch is required on the board in order that the float switch can be over-ridden and the pump checked for maintenance purposes.

All electrical wiring must be done in accordance with the requirements of SANS 10142 (latest edition & amendments).

PFB 06 DETAILS OF MAINTENANCE WORK

PFB 06.01 GENERAL

The Contractor shall be responsible for the complete maintenance of all the equipment, components, installations and systems forming part of this repair and maintenance contract for Installation B. The Contractor shall strictly adhere to General Maintenance, and Technical Specification FB: Steam Distribution Installations, with regard to the maintenance period, obligations, responsibilities, actions and activities, etc., which shall also include the following maintenance actions:

- (a) Routine preventative maintenance: A guideline to the required actions is provided in specification FB. The actions will not be limited to these guidelines, but shall include all additional actions, work, materials, etc, necessary to maintain this installation at an acceptable level.
- (b) Corrective maintenance as described in General Maintenance.
- (c) Breakdown maintenance as described in General Maintenance.

For this particular installation fatal breakdown shall be defined as no steam being available at all due to a failure of this system as a whole.

Emergency breakdown shall be defined as any other equipment, components, and systems preventing the provision of steam to the consumer points due to a failure of part of this system at the particular point of incident.

PFC - HOT-WATER GENERATING INSTALLATION

CONTENTS

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PFC 02	GENERAL DESCRIPTION OF INSTALLATION
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PFC 04	STATUS OF EXISTING INSTALLATION
PFC 05	DETAILS OF REPAIR WORK
PFC 06	DETAILS OF MAINTENANCE WORK

PFC 01 SCOPE

(a) This specification covers the particulars of the repair and maintenance work to the hot-water generating installation at the **DCS: Ncome Prison**. This Particular Specification shall be read in conjunction with the Technical Specification FC: Hot-water Generating Installations, and all additional and technical specifications compiled as part of this document, in particular the following Additional Specifications:

SA: General Maintenance

SB: Operating and Maintenance Manuals

SC: General Decommissioning, Testing and Commissioning Procedures

The intended repair and maintenance work to this installation will restore the existing installation to a safe, efficiently functional system that complies with all statutory regulations and applicable standards, in the process repairing all defects and shortfalls. Monthly maintenance responsibilities for each installation shall commence with access to the site. A difference shall be made in payment for maintenance prior to and after practical completion of repair work. The Departmental representative / Engineer shall instruct the contractor to conduct repair / maintenance work that is to be completed and maintained by the Contractor for the full duration of the 24-month Contract period.

- (b) The installations to be maintained under this Contract includes the following:
- (i) Storage calorifier installation in the Boiler House and various other installations;
 - (ii) All domestic water installations and equipment in the plant rooms;
 - (iii) All hot-water circulating pump sets;
 - (iv) Steam and condensate piping and equipment in the plant rooms;
 - (v) Electrical control equipment, wiring, cabling, panels and instrumentation associated with each installation.

PFC 02 GENERAL DESCRIPTION OF EXISTING INSTALLATION

The existing hot-water generating installations are situated in various plant rooms at the various prisons. These installations currently consist of storage calorifiers with steam heater batteries and a pipes distribution network from and to the storage calorifiers. These installations are equipped with in-line hot-water circulating pump sets. Steam is provided to the steam heater batteries by means of the steam distribution network on site.

These systems provide hot water for ablution facilities, consisting of wash-hand basins, wash troughs and showers to the following:

- (a) Main prison ± 10000 inmates
- (c) Boiler house also provides hot water to the central laundry and kitchen.

NB: The information in red above is site specific and should be adjusted accordingly.

The technical details of these installations are provided in section PFC 03.

PFC 03 TECHNICAL DETAILS OF EXISTING INSTALLATION

At the time of compilation of this document the existing installation consisted of the equipment and plant listed below with their relevant technical details.

PFC 03.01 TECHNICAL DETAILS: STORAGE CALORIFIERS

PFC 03.01.01 Various plant rooms on site positions on site

No.	Item	Technical Detail
01.	Storage capacity	5 000 / 2500 litres/vessels
02.	Number of vessels	11
03.	Steam heater banks	
	03.01. Manufacturer	
	03.02. Factory no	MTSB005
	03.03. Capacity	± 0.001 m ³ /heater bank
	03.04. Number of heater banks	1/vessel
	03.05. Steam W.P	700 kPa
	03.06 Steam T.P	1050 kPa
	03.07. Manufacturing date	2011
04.	Steam heating control valve	Horne 20 mm dia.
05.	Water pressure	±450 kPa

PFC 03.02 CIRCULATING PUMPS

PFC 03.02.01 Boiler House

No.	Item	Technical Detail
01.	Type	In-line canned motor HW circulating pump
02.	Number of pumps	2
03.	Manufacturer	TBA
04.	Model no.	TBA

PFC 04 STATUS OF EXISTING INSTALLATION

At the time of compilation of this document the status of the existing installations was noted as follows:

- (a) Boiler house installation:
 - (i) Generally in good condition
 - (ii) No condensate leaks
 - (iii) No water leaks from calorifiers
 - (iv) Circulating pump operational
 - (v) Lagging and cladding in good condition

PFC 05 DETAILS OF REPAIR WORK

The following work shall form part of the intended repair work to the hot-water generating installations. This work shall be done in accordance with the relevant regulations, codes, specifications and Technical Specification FC: Hot-water Generating Installations, as set out in this document. The following work shall be included:

PFC 05.01 GENERAL

The Contractor shall at the start of the contract inspect the items, systems, equipment, components and installations listed below. This inspection shall include the establishing of any defects, leaks, conditions, damages, shortfalls, structural soundness, repairs required, details of existing equipment, suitability of equipment for the purpose they serve, etc. The Contractor shall report to the Departmental Representative/Engineer in writing on all the above and the following items. No repair work shall commence prior to approval by the Departmental Representative/Engineer:

- a) Hot-water storage calorifiers, including lagging and cladding and steam heater batteries;
- b) Steam and condensate installation, including fittings, piping, valves, steam traps, lagging and cladding, etc.;
- c) Bracketing system;
- d) Heating control equipment and instrumentation;
- e) Hot-water circulating pump sets;
- f) Electrical control panel and wiring.

The general scope of work at the time of going to tender is defined as follows:

- a) The servicing of all hot-water storage calorifiers
- b) Preparation and painting of all exposed piping and equipment in accordance with the manufacturer's specification;
- c) The servicing, repair and where necessary replacing of existing hot-water circulating pumps to all the storage calorifier installations, including all related electrical work;
- d) Handing over of complete systems, to the satisfaction of the Departmental Representative/Engineer, on completion of the repair work on which the maintenance period shall commence;
- e) The supply and compilation of operating and maintenance manuals;
- f) The testing, adjusting and commissioning of all systems;
- g) The introduction of a maintenance control plan, including logging, recording and control procedures.

PFC 05.02 DETAIL WORK

PFC 05.02.01 Standby Hot Water Circulating Pumps

Additional hot water circulating pumps complete with inlet and outlet valves, strainers and non-return valves are required. They shall have flow rates adjustable up to 5 cubic meters/hour at heads up to 6 meters and be of an approved manufacturer.

The additional pumps are required as standby units to the existing pumps and allowance must be made for cutting into the existing hot water return piping supplying and installing the necessary piping, fittings, valves, etc. required to return the systems to full working condition.

PFC 05.03 PAINTING

The Contractor shall prepare, clean and paint all steel surfaces and equipment where directed by the Departmental Representative/Engineer in accordance with Specification OWG 371: Specification of Materials and Methods to be used (Fourth edition, October 1993 or latest version).

PFC 06.01 GENERAL

The Contractor shall be responsible for the complete maintenance of all the equipment, components, installations and systems forming part of this repair and maintenance contract for Installation C. The Contractor shall strictly adhere to General Maintenance, and Technical Specification FC: Hot-water Generating Installations, with regard to the maintenance period, obligations, responsibilities, actions and activities, etc, which shall also include the following maintenance actions:

- (a) Routine Preventative Maintenance. A guideline to the required actions is provided in specification FC. The actions will not be limited to these guidelines, but shall include all additional actions, work, materials, etc., necessary to maintain this installation at an acceptable level.
- (b) Corrective Maintenance as described and defined in General Maintenance.
- (c) Breakdown Maintenance as described and defined in General Maintenance.
- (d) For this particular installation no fatal breakdown is applicable.
- (e) Emergency breakdown shall be defined as no provision of hot water to the consumer points due to a failure of equipment, components and systems of this particular installation.

TECHNICAL DETAILS: BOILER(S)

BOILER TECHNICAL DETAILS		
1	Manufacturer	
2	Model no	
3	Boiler serial no	
4	Registration certificate no	
5	Boiler type	
6	Design code	
7	Factory no	
8	Manufacturing date/year	
9	Maximum continuous rating	
10	Design pressure rating	
11	Authorized working gauge pressure	
12	Normal operation pressure	
13	Safety blow-off pressure	
14	Test pressure	
15	FD fan model no	
16	FD fan power capacity	
17	Stoker Make & type	
18	Stoker pulling motor capacity	
19	Chain grade stoker	
19	ID fan power capacity	
20	Feed pump	
21	Feed pump power capacity	

22	Grit collector	
23	Chimney stack type	
24	Boiler control panel	
25	Level control	

SCHEDULE 1 – INSPECTION

1.1. CONSUMABLES AND BOILER INSPECTION

NOTE: VERY IMPORTANT FOR THE BOILER INSPECTION

The specification is for the preparation of the steam boiler on site at your Correctional Centers **FOR 6 monthly** external and internal examination by the inspector as required in terms of Occupational Health Safety act No 85 1993 as amended (Oct2009) and Pressure Equipment Regulations (PER).

For every **6 months** of boiler inspection (external) a comprehensive report is required, clearly communicating the state/condition of the boiler.

For every **12 months** boiler inspection (external) a **certificate of continuity** will be issued by accredited **Approved Inspection Authority (AIA)**.

For every **36 months boiler** inspection (internal & external), a **certificate of continuity** will be issued by the **accredited Approved Inspection Authority (AIA)**

TABLE 1 - CONSUMABLES AND BOILER INSPECTION					
ITEM	DESCRIPTION	Unit	Qty	Rate	Amount
1	Water treatment equipment				
	Water test report every month				
	Water softener				
1.1	Inspect, test, service, clean and re-commission water softener equipment. Including analyses feed water and recharge salt container with salt	As in when	12	R	R
2	Chemical dosing equipment				
2.1	Inspect, test, service, clean and re-commission chemical dosing equipment, including replacement of chemical solenoid dosing pump, analyse feed water and fill with the correct chemicals	As in when	12	R	R
3	Ash removal	Weekly		R n/a	R n/a
4	Maintenance work to boiler during statutory inspection				
	Subject to requirements of the relevant health and safety standard incorporated into these Regulation under 44 of the OHS Act , the user shall cause:				
	Every fire-tube steam generator to be subjected to an internal and external inspection every 12 months. By an approved inspection authority for in service inspection appointed by the user in writing.	Annual	1		

	The boiler certificate to be issued.				
4.1	Clean out and descale boiler	Boilers	1	R	R
4.2	Inspection of boiler water side and integral pipework	Boilers	1	R	R
4.3	Replace all manhole, hand hole, mud hole cover seal	Boilers	1	R	R
4.4	Check the full operation of blow down valve	Boilers	1	R	R
4.5	Replace all smoke box covers and door joint seals with new approved joint seal and insulation	Boilers	1	R	R
4.6	Check for full operation of water pump	Boilers	1	R	R
4.7	Check all safety valves for full operation	Boilers	1	R	R
4.8	Condition of refractories work (brick work all)	Boilers	1	R	R
4.9	Check the full operation of Main stop valve	Boilers	1	R	R
4.10	Check the full operation of ID and FD fans	Boilers	1	R	R
4.11	Check the full operation of control panel and drives	Boilers	1	R	R
4.12	Check the chimney stacks	Boilers	1	R	R
4.13	Co2 test with report	Boilers	1	R	R
4.14	Check the full operation of feed water and non-return valve	Boilers	1	R	R
4.15	Check the full operation screw conveyor and gearbox	Boilers	1	R	R
4.16	Upon conclusion of test the boiler shall be placed back on range and steamed. All boiler controls shall be tested and any leaks be repaired.	Boilers	1	R	R
		SUBTOTAL (CARRIED TO SUMMARY)			R

1.2. SCHEDULE FOR BOILER SERVICES AND STATUTORY INSPECTIONS

ITEM	SCHEDULE FOR SERVICE OR INSPECTION	YEAR 1 RATE PER ITEM	YEAR 2 RATE PER ITEM	YEAR 3 RATE PER ITEM	TOTAL 1+2+3
BOILER SERVICES AND STATUTORY INSPECTION					
1	Water Treatment	R	R	R	R
2	Chemical Dosing Equipment	R	R	R	R
3	Ash Removal	R	R	R	R
4	Maintenance Work	R	R	R	R
TOTAL FOR YEAR 1 CARRIED TO SUMMARY SHEET (PAGE 202)					
					R

SCHEDULE 2 – SERVICE

2.1. PRICES FOR SERVICING

SEMI-ANNUAL SERVICES EQUIPMENT UNITS AT CORRECTIONAL SERVICES DEPARTMENT.

Note:

1. The description of the service required entails the following: The servicing of the units as per the attached checklist.
2. Prices for servicing include checking of equipment as stipulated in annexure A and must include labor, transport, consumables, minor and incidental repairs and all other overheads.
3. Prices are to be totaled and carried over to the summary page.

Description of property

1. Correctional Services: Prisons consist of hot water systems and incinerators.

The list below indicates the components or systems which require regular services.

ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
1	FD fan						
1.1	Motor 5.5 KW	01	R	R	R	R	R
1.2	Pulley	01	R	R	R	R	R
1.3	Impeller + balancing With certificate	01	R	R	R	R	R
1.4	Bearings	01	R	R	R	R	R
1.6	FD fan blades	01	R	R			
2	ID fan						
2.1	Motor fan 45 KW	01	R	R	R	R	R
2.2	Impeller + balancing With certificate	01	R	R	R	R	R
2.3	Bearings	01	R	R	R	R	R
2.4	V - belt	01	R	R	R	R	R
2.5	Main shaft	01	R	R	R	R	R
2.6	ID fan blades	01	R	R	R	R	R
	SUB TOTAL						R

ITEM NO	DESCRIPTION SERVICING	QTY	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR SERVICES	TOTAL AMOUNT YEAR 1+2+3
3	Chain grate stoker					
3.1	Main drive shaft c/w sprocket	01	R	R	R	R
3.2	Main worm wheel	01	R	R	R	R
3.3	Carbo frax block	01	R	R	R	R
3.4	Side seal	01	R	R	R	R
3.5	Rear side seal	01	R	R	R	R
3.6	Front side seal	01	R	R	R	R
3.7	Rear roller and shaft c/w	01	R	R	R	R
3.8	Stainless steel Wearing strips	01	R	R	R	R
3.9	Non Asbestos sealing rope	01	R	R	R	R
3.10	Guide vane	01	R	R	R	R
3.11	Motor 1.5 kw	01	R	R	R	R
3.12	Motor 2.5 kw	01	R	R	R	R
	SUB TOTAL					R

ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
7	Worm screw conveyor						
7.1	160mm x 18m pipe worm screw conveyor (two pieces)	01	R	R	R	R	R
7.2	160mm x 5m Cross worm screw conveyor	01	R	R	R	R	R
7.3	Complete motor 5.5 kw with gear box for (160mmx18m) worm screw	01	R	R	R	R	R
7.4	Complete motor 2.5 kw with gear box for (160mmx5m) Cross worm screw	01	R	R	R	R	R
8	Refractory work						
8.1	Secondary arch	01	R	R	R	R	R
8.2	Ignition arch	01	R	R	R	R	R
8.3	Bridge wall	01	R	R	R	R	R
8.4	Recast rear access door	01	R	R	R	R	R
	SUB TOTAL						R

ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
9	Valve approved By NDPW specification						
9.1	Blow down 50 mm	01	R	R	R	R	R
9.2	Angel crown 150 mm	01	R	R	R	R	R
9.3	Screw down non return 150 mm	01	R	R	R	R	R
9.4	Angle feed check 50 mm	01	R	R	R	R	R
9.5	Safety double spring loaded 100mm	01	R	R	R	R	R
9.6	Mobrey switch	01	R	R	R	R	R
9.7	Main valve 300mm	01	R	R	R	R	R
9.8	Sequencing 25mm	01	R	R	R	R	R
9.9	Stop valve 40 mm	01	R	R	R	R	R
9.10	Ball valve 20mm	01	R	R	R	R	R

10	Ball valve steam						
10.1	Ball valve 25-50mm	01	R	R	R	R	R
11	Check valve						
11.1	Check valve 20mm	01	R	R	R	R	R
11.2	Check valve 32mm	01	R	R	R	R	R
	SUB TOTAL						R
ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
12	Boiler feed pump						
12.1	Complete replacement water pump	01	R	R	R	R	R
12.2	Motor 7.5 kw	01	R	R	R	R	R
12.3	Motor 11 kw	01	R	R	R	R	R
12.4	6 stage Pump	01	R	R	R	R	R
13	Steam valve for the for following sizes						
13.1	15mm dia	01	R	R	R	R	R
13.2	20mm dia	01	R	R	R	R	R
13.3	50mm dia	01	R	R	R	R	R
13.4	80mm dia	01	R	R	R	R	R
13.5	100mm dia	01	R	R	R	R	R
13.6	150mm dia	01	R	R	R	R	R
	SUB TOTAL						R

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ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
14	Calorifiers						
14.1	Heating battery with two coil	01	R	R	R	R	R
14.2	Home valve 20mm	01	R	R	R	R	R
14.3	Set of steam trap 20mm as per DPW spec	01	R	R	R	R	R
14.4	Safety valve 32mm	01	R	R	R	R	R
14.5	Temperature (0-120) 10mm	01	R	R	R	R	R
14.6	Pressure gauge (0_1600)10mm	01	R	R	R	R	R
14.7	Home thermostatic temp control valve (25-150°C)	01	R	R	R	R	R
14.8	Steam valve 25mm	01	R	R	R	R	R
14.9	Circulating pump 25mm (28-48) watts 0.21A	01	R	R	R	R	R
14.10	Sight glass 15mm	01	R	R	R	R	R
14.11	Sight glass 20mm	01	R	R	R	R	R
	SUB TOTAL						R

ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICE S	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
15	Strainers						
15.1	Strainer 32 mm	01	R	R	R	R	R
15.2	Strainer 40 mm	01	R	R	R	R	R
16	Copper pipe class two						
16.1	Copper pipe 15 mm	p/m	R	R	R	R	R
16.2	Copper pipe 32 mm	p/m	R	R	R	R	R
17	Boiler tubes						
17.1	Replace one boiler tube	01	R	R	R	R	R
18	Pressure reducing valve station						
18.1	PRV 25 mm	01	R	R	R	R	R
18.2	PRV 32 mm	01	R	R	R	R	R
18.3	PRV 40 mm	01	R	R	R	R	R
19	Grundfos						
19.1	CRS pump for condensate extraction	01	R	R	R	R	R
	SUB TOTAL						R

ITEM NO	DESCRIPTION SERVICING	QTY	RATE PER SERVICE FOR EACH ITEM	YEAR 1 UNIT PRICE/ SERVICE ALLOW FOR 2 SERVICES	YEAR 2 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	YEAR 3 UNIT PRICE/ SERVICE ALLOW FOR 4 SERVICES	TOTAL AMOUNT Year 1+2+3
20	Paints work						
20.1	Chimney silver with resistance paint	03	R	R	R	R	R
20.2	Boiler house floor with green paint 300 m ² (floor paint)	01	R	R	R	R	R
20.3	Lines around the boilers with yellow paint 120m x 75mm(road making paint)	01	R	R	R	R	R
20.4	Steps to the boiler with red and road making paint)	01	R	R	R	R	R
SUB TOTAL							
TOTAL FOR YEAR 1 CARRIED TO SUMMARY SHEET (PAGE 202)							R

SCHEDULE 3 – REPAIRS AND MAINTENANCE

SCHEDULE FOR REPAIRS AND MAINTENANCE SCHEDULE FOR BOILERS

Note:-

1. The description of the service required entails the following: The repairs of the units as per the attached
2. Prices for servicing include checking of equipment and topping of gas or oil when its' low as stipulated in annexure A must, include, labor, transport, consumables, minor and incidental repairs and all other overheads.
3. Prices are to be multiplied by quantities and calculated in totals and all totals be carried over to the summary page.

Description of property

4. Department of Correctional Service.
5. The list below indicates the complexes which require regular services.

SCHEDULE 3.1.: THE REPLACEMENT PARTS FOR THE BOILER AND ALL STEAM RELATED GENERATION COMPONENTS

**Provide costs which include supply, installation and commissioning
All equipment/accessories/fittings must be in accordance with DPW specifications, unless stated otherwise.**

SCHEDULE 3.1.: THE REPLACEMENT PARTS FOR COAL FIRED BOILER AND ALL STEAM RELATED GENERATION COMPONENTS

Item	Description	Unit	Qty	Rate	Year 1	Year 2	Year 3	Total Amount Year 1+2+3
	MAJOR EQUIPMENT		1					
1.	Forced Draft (FD) Fan in accordance with John Thompson specifications, complete with:		1	R	R	R	R	R
1.1.	- 5.50 kW Motor		1	R	R	R	R	R
1,02	- Pulley		1	R	R	R	R	R
1,03	- Impeller + balancing with certificate of compliance		1	R	R	R	R	R
1,04	- Bearings		1	R	R	R	R	R
1,05	- FD fan blades		1	R	R	R	R	R
2,00	Induced Draft (ID) Fan in accordance with Mitchell Cotts specifications, complete with:		1	R	R	R	R	R
2,01	- 45.0 kW Motor		1	R	R	R	R	R
2,02	- Impeller + balancing with certificate of compliance		1	R	R	R	R	R
2,03	- Bearings		1	R	R	R	R	R

2,04	- V - belt		1	R	R	R	R	R
2,05	- Main shaft		1	R	R	R	R	R
2,06	- ID fan blades		1	R	R	R	R	R
3,00	Chain grate stoker, complete with:		1	R	R	R	R	R
3,01	- Main drive shaft c/w sprocket		1	R	R	R	R	R
3,02	- Main worm wheel		1	R	R	R	R	R
3,03	- Carbo frax block		1	R	R	R	R	R
3,04	- Side seal		1	R	R	R	R	R
3,05	- Rear side seal		1	R	R	R	R	R
3,06	- Front side seal		1	R	R	R	R	R
	SUB-TOTAL							R

3,07	- Rear roller and shaft c/w stainless steel and wearing strips		1	R	R	R	R	R
3,08	- Non Asbestos sealing rope		1	R	R	R	R	R
3,09	- Guide vane		1	R	R	R	R	R
3,10	- 1.5 kW Motor		1	R	R	R	R	R
3,11	- 2.5 kW Motor		1	R	R	R	R	R
4,00	Coal feed section, complete with:		1	R	R	R	R	R
4,01	- Coal hopper		1	R	R	R	R	R
4,02	- Worm wheel operating shaft		1	R	R	R	R	R
4,03	- Guillotine door		1	R	R	R	R	R
4,04	- Hopper support		1	R	R	R	R	R

4,05	- Lifting mechanism shaft complete		1	R	R	R	R	R
4,06	- Guillotine door support cable		1	R	R	R	R	R
SUB - TOTAL								R

Item	Description	Unit	Qty	Rate	Year 1	Year 2	Year 3	Total Amount Year 1+2+3
	Major equipment		1	R	R	R	R	R
5.	Boiler feed pump, complete with:		1	R	R	R	R	R
5.1.	- Water pump replacement		1	R	R	R	R	R
5.2.	- 7.5Kw Motor		1	R	R	R	R	R
5.3.	- 11kW Motor		1	R	R	R	R	R
5.4.	- 6 stage Pump		1	R	R	R	R	R
6.	Stocker drive, complete with:		1	R	R	R	R	R
6.1.	- 5.5kW Motor		1	R	R	R	R	R
6.2.	- Gear box motor		1	R	R	R	R	R
6.3.	- 1 292mm wide chain grate mat 0.5 m		1	R	R	R	R	R
7.	Worm screw conveyor, complete with:		1	R	R	R	R	R
7.1.	- 160mm x 18m pipe worm screw conveyor		1	R	R	R	R	R
7.2.	- 160mm x 5m Cross worm screw conveyor		1	R	R	R	R	R
7.3.	- 5.5 kW Motor c/w gear box for (160mmx18m) worm screw		1	R	R	R	R	R
7.4.	- 2.5 kW Motor c/w gear box for (160mmx5m) cross work screw		1	R	R	R	R	R
8.	Grundfos , complete with:		1	R	R	R	R	R
8.1.	- CRS pump for condensate extraction		1	R	R	R	R	R

9.	Refectory work, complete with:		1	R	R	R	R	R
9.1.	- Secondary arch		1	R	R	R	R	R
9.2.	- Ignition arch		1	R	R	R	R	R
9.3.	- Bridge wall		1	R	R	R	R	R
9.5.	- Recast rear access door		1	R	R	R	R	R
SUB-TOTAL								R
10.	Calorifiers, complete with:		1	R	R	R	R	R
10.1.	- Heating battery with two coils		1	R	R	R	R	R
10.2.	- Horne valve 20mm		1	R	R	R	R	R
10.3.	- Set of steam trap 20mm as per DPW specifications		1	R	R	R	R	R
10.4.	- Safety valve 32mm		1	R	R	R	R	R
10.5.	- Temperature (0-120) 10mm		1	R	R	R	R	R
10.6.	- Pressure gauge (0_1600)10mm		1	R	R	R	R	R
10.7.	- Horne thermostatic temp control valve (25- 150°C)		1	R	R	R	R	R
10.8.	- Steam valve 25mm		1	R	R	R	R	R
10.9.	- Circulating pump 25mm (28-48) watts 0.21A		1	R	R	R	R	R
10.1 0.	- Sight glass 15mm		1	R	R	R	R	R
10.1 1	- Sight glass 20mm		1	R	R	R	R	R
SUB-TOTAL								R

Item	Description	Unit	Qty	Rate	Year 1	Year 2	Year 3	Total Amount Year 1+2+3
	Fittings, accessories and piping		1	R	R	R	R	R
11.	ID and FD fan control unit, complete with:		1	R	R	R	R	R
11.1.	- Single knob combustion		1	R	R	R	R	R
11.2.	- ID damper control		1	R	R	R	R	R
12.	Boiler tubes		1					
12.1	- Replace boiler tubes which have exceeded service life/damaged		1	R	R	R	R	R
13.	Strainers		1	R	R	R	R	R
13.1.	- Strainer 32mm		1	R	R	R	R	R
13.2.	- Strainer 40mm		1	R	R	R	R	R
14.	Copper pipe class two		1	R	R	R	R	R
14.1.	- Copper pipe 15 mm		1	R	R	R	R	R
14.2.	- Copper pipe 32 mm		1	R	R	R	R	R
15.	Replacing with new steam trap set		1	R	R	R	R	R
15.1.	- 15mm dia		1	R	R	R	R	R
15.2.	- 20mm dia		1	R	R	R	R	R
15.3.	- 25mm dia		1	R	R	R	R	R

16.	Replacing with new expansion joints		1	R	R	R	R	R
16.1.	- 65mm dia		1	R	R	R	R	R
16.2.	- 80mm dia		1	R	R	R	R	R
16.3.	- 100mm dia		1	R	R	R	R	R
16.4.	- 200mm dia		1	R	R	R	R	R
	SUB-TOTAL							R

17.	Reducing socket steam		1	R	R	R	R	R
17.1.	- Socket 8x12 – 8x25 mm		1	R	R	R	R	R
17.2.	- Socket 32x15 – 32x25 mm		1	R	R	R	R	R
17.3.	- Socket 40x15 – 40x32 mm		1	R	R	R	R	R
17.4.	- Socket 50x15 – 50x40 mm		1	R	R	R	R	R
17.5.	- Socket 80x20 – 80x65mm		1	R	R	R	R	R
17.6.	- Socket 100x40 – 100x80mm		1	R	R	R	R	R
	Replacing lagging cladding to the steam pipe with the following pipe sizes:							
18.	- 15mm dia x 25mm		1	R	R	R	R	R
18.1.	- 20mm dia x 25mm		1	R	R	R	R	R
18.2.	- 32mm dia x 25mm		1	R	R	R	R	R
18.3.	- 65mm dia x 25mm		1	R	R	R	R	R
18.4.	- 100 mm dia x 40 mm		1	R	R	R	R	R
19.	Replacing brackets for the following pipes		1	R	R	R	R	R
19.1.	- 15 to 50mm dia		1	R	R	R	R	R
19.2.	- 65 to 80mm dia		1	R	R	R	R	R

19.3.	- 100 to 150mm dia		1	R	R	R	R	R
20.	Reducing tees steam		1	R	R	R	R	R
20.1.	- Tees 8x6-15x8mm		1	R	R	R	R	R
20.2.	- Tees 20x8 - 20x15mm		1	R	R	R	R	R
20.3.	- Tees 25x8-25x20 mm		1	R	R	R	R	R
20.4.	- Tees 32x15-32x25mm		1	R	R	R	R	R
20.5.	- Tees 40x15-40x32mm		1	R	R	R	R	R
20.6.	- Tees 50x15-50x40mm		1	R	R	R	R	R
20.7.	- Tees 65x15-65x50mm		1	R	R	R	R	R
	SUB-TOTAL							R

20.8.	- Tees 80x20-80x65mm		1	R	R	R	R	R
20.9.	- Tees(W/O) 100x40-100x80mm		1	R	R	R	R	R
21.	Bends 90 deg steam		1	R	R	R	R	R
21.1.	- Bends 6 -10mm		1	R	R	R	R	R
21.2.	- Bends 15-32mm		1	R	R	R	R	R
21.3.	- Bends 40-80mm		1	R	R	R	R	R
21.4.	- Bends W/O 100-150mm		1	R	R	R	R	R
22.	Nipples steam fitting (w/o)		1	R	R	R	R	R
22.1.	- Nipples 6-10mm		1	R	R	R	R	R
22.2.	- Nipples 15-32mm		1	R	R	R	R	R
22.3.	- Nipples 40-80mm			R	R	R	R	R
23.	Unions fitting		1	R	R	R	R	R
23.1.	- Union 12 mm		1	R	R	R	R	R
23.2.	- Union 15-32 mm		1	R	R	R	R	R
23.3.	- Union 40-80 mm		1	R	R	R	R	R
24.	Steam fitting screwed sockets		1	R	R	R	R	R
24.1.	- Socket 6 -10 mm		1	R	R	R	R	R
24.2.	- Socket 15 -32 mm		1	R	R	R	R	R
24.3.	- Socket 40 -80 mm		1	R	R	R	R	R

24.4.	- Socket 100 - 150mm		1	R	R	R	R	R
25.	Elbows 90 deg screwed		1	R	R	R	R	R
25.1.	- Elbows 6 -10 mm		1	R	R	R	R	R
25.2.	- Elbows 15 - 32mm		1	R	R	R	R	R
25.3.	- Elbows 40 - 80mm		1	R	R	R	R	R
25.4.	- Elbows (W/O) 100 -150mm		1	R	R	R	R	R
	SUB-TOTAL							R

	Valves, complete with:		1	R	R	R	R	R
26.	- Blow down 50mm		1	R	R	R	R	R
26.1.	- Angel crown 150mm		1	R	R	R	R	R
26.2.	- Screw down non return 150mm		1	R	R	R	R	R
26.3.	- Angle feed check 50mm		1	R	R	R	R	R
26.4.	- Safety double spring loaded 100mm		1	R	R	R	R	R
26.5.	- Mobrey switch		1	R	R	R	R	R
26.6.	- Main valve 300mm		1	R	R	R	R	R
26.7.	- Sequencing 25mm		1	R	R	R	R	R
26.8.	- Stop valve 40mm		1	R	R	R	R	R
27.	Ball valve steam		1	R	R	R	R	R
27.1.	- Ball valve 20mm		1	R	R	R	R	R
27.2.	- Ball valve 25-50mm		1	R	R	R	R	R
28.	Check valve		1	R	R	R	R	R
28.1.	- Check valve 20mm		1	R	R	R	R	R
28.2.	- Check valve 32mm		1	R	R	R	R	R
29.	Pressure reducing valve station		1	R	R	R	R	R
29.1.	- PRV 25 mm		1	R	R	R	R	R
29.2.	- PRV 32 mm		1	R	R	R	R	R
29.3.	- PRV 40 mm		1	R	R	R	R	R
30.	Steam valve		1	R	R	R	R	R
30.1.	- 15mm dia		1	R	R	R	R	R
30.2.	- 20mm dia		1	R	R	R	R	R
30.3.	- 50mm dia		1	R	R	R	R	R
30.4.	- 80mm dia		1	R	R	R	R	R

30.5.	- 100mm dia		1	R	R	R	R	R
30.6.	- 150mm dia		1	R	R	R	R	R
	SUB-TOTAL							R
Item	Description	Unit	Qty	Rate	Year 1	Year 2	Year 3	Total Amount Year 1+2+3
31.	ELECTRICAL PARTS		1	R	R	R	R	R
31.1	- 2.5mm- x 5 core cable swa p/m		1	R	R	R	R	R
31.2.	- 10mm ² - x 4core cable swa p/m		1	R	R	R	R	R
31.3.	- 16mm ² - x 4core cable swa p/m		1	R	R	R	R	R
31.4.	- Alarm		1	R	R	R	R	R
31.5.	- High pressure switch		1	R	R	R	R	R
31.6.	- Electronic ID (JH) control box (C/P)		1	R	R	R	R	R
31.7.	- Electronic FD (JH) control box (C/P)		1	R	R	R	R	R
31.8.	- T/P C/B10 amps		1	R	R	R	R	R
31.9.	- T/P C/B 20 amps		1	R	R	R	R	R
31.10.	- T/P C/B 30 amps		1	R	R	R	R	R
31.11.	- Contactor 380 volts		1	R	R	R	R	R
31.12.	- Contactor 220 volts		1	R	R	R	R	R
31.13.	- Probes hot water tank control		1	R	R	R	R	R
32.	Over load							
32.1.	- 16A – 22A relay		1	R	R	R	R	R

32.2.	- 30A – 55A relay		1	R	R	R	R	R
32.3.	- 88A – 125A relay		1	R	R	R	R	R
32.4.	- 150 watts bulbs 220 volts		1	R	R	R	R	R
32.5.	- Florescent fitting 1.2m complete		1	R	R	R	R	R
32.6.	- Single contact Bulbs 12 volts		1	R	R	R	R	R
	SUB-TOTAL							R

33.	PAINT WORK			R	R	R	R	R
33.1.	- Chimney silver with resistance paint		1	R	R	R	R	R
33.2.	- Boiler house floor with green paint 300 m ² (floor paint)		1	R	R	R	R	R
33.3.	- Lines around the boilers with yellow paint 120m x 75mm(road making paint)		1	R	R	R	R	R
33.4.	- Steps to the boiler with red and road making paint)		1	R	R	R	R	R
TOTAL FOR YEAR 1 CARRIED TO SUMMARY SHEET (PAGE 202)								R

SCHEDULE 4 – TRANSPORT

SCHEDULE 4: SCHEDULE FOR TRANSPORT						
4	TRANSPORT COST FOR CONTRACT RELATED TRAVELLINGS	UNIT	Year 1	YEAR 2	YEAR 3	AMOUNT (RANDS) Year (1+2+3)
4.1	Transport cost of a vehicle with a loading capacity of 1 ton	Price/km As per the jurisdiction	R /km	R /km	R /km	R
4.2	Transport cost of a vehicle with a loading capacity of 2 ton	Price/km As per the jurisdiction	R /km	R /km	R /km	R
TOTAL FOR YEAR 1 CARRIED TO SUMMARY SHEET (PAGE 202)						R

Note:

1. The costs of workers and drivers traveling time shall be deemed to be included with the unit rates for transport costs
 2. All distances traveled will be measured from the Client Department to Source of Material/Suppliers.
 3. The map showing the jurisdiction for the relevant region should be attached. And the kilometers should be calculated for the return journey.
 4. Vehicle specifications such as engine capacity, and proof of a valid service plan should be produced if requested.
1. For hired vehicles it should be noted that the distances are still calculated from Client Department to Source of Material/Suppliers.
 2. The Department shall not be responsible for any damages that may occur on the vehicle, but the driver or the party that authorized the vehicle to be used.

SCHEDULE 5 - LABOUR AND MATERIAL

SCHEDULE 5: RATES FOR LABOUR AND MATERIAL							
		Qty	Year 1 (Rate)	Amount Year 1 (Rate*Qty)	Amount Year 2 (Rate*Qty)	Amount Year 3 (Rate*Qty)	Total amount (year 1+year 2+year 3)
1.	Labour for all boiler operations and Maintenance.						
1.1.	The rates for labor will be deemed to include for statutory Inspection (AIA) minimum labor rates, contribution to bonus, holiday, pension, medical funds etc., for normal working hours, as well as for transport costs including traveling time, but excluding VAT	Annual	R	R	R	R	R
1.2.	Boiler operation 24 hours per day for the period of 36 months. It is the Bidder responsibility to ensure that operators (3 * supervisor ,Safety Officer, Operator and Assistant) are available per shift	12 Months	R	R	R	R	R

SUMMARY PAGE

BID FOR MAINTENANCE, REPAIRS AND OPERATION TO BOILERS AND ALL STEAM RELATED GENERATION COMPONENTS FOR THE PERIOD OF 36 MONTHS TERM CONTRACT.

The total tender price for this service must include all labor and material required for the proper execution of the work and shall be carried over to the Tender Form which must be returned together with this document.

No.	SCHEDULE DESCRIPTION	AMOUNT (RANDS)
1.	Schedule 1: Boiler Inspection	R
2.	Schedule 2: Service	R
3.	Schedule 3: Repair	R
4.	Schedule 4: Transport	R
5.	Schedule 5: Labour and Material	R
	Sub total	R
	Value Added Tax (VAT)	R
Year 1 total to be Carried Forward to Form of Offer and Acceptance (DPW-07) in line with CIDB Grade advertised		Total R

TENDERER'S SIGNATURE: _____

ADDRESS: _____

DATE: _____

PRICED SPECIFICATION:

A priced specification must be submitted with the tender documents.

NB* Schedule 1, 2, 3, 4 & 5 for year 1 **only** to be included to the form of offer and acceptance (DPW 07 EC).

ANNEXURE

ANNEXURE A: PREVENTATIVE MAINTENANCE SERVICE SCHEDULES

BID FOR NAPIERVILLE CORRECTIONAL SERVICES MAINTENANCE, REPAIRS AND OPERATION TO BOILERS AND ALL STEAM RELATED GENERATION COMPONENTS FOR THE PERIOD OF 24 MONTHS

Table A1: Period Boiler Inspection Schedule (Steam and Hot water)

Daily	Frequency			Recommended test	Accomplished By			
	Weekly	Monthly	Quarterly		Yearly	Boiler Operator	Service Technician	Checked
X					Look around the machine and check for leaks around the boiler	X		
X					Read the boiler's gauge and check results against owners manual's	X		
X					Listen for noises that are out of the ordinary for the machine	X		
X					Ensure that the machine is running smoothly without extra vibrations	X		
X					Check to ensure the combustion air opening is unobstructed	X		
X					Check pressure and/or temperature readings to ensure they are within the design range	X		
X					Check feed-water and condensate pumps for proper operation	X		

X				and leaky packing	X
X				Examine traps, check all valves(boiler drain valve, steam valve etc.), expansion tank or condensate tank and other parts of the system	X
X				Check the condition of the chain grate stoker/ coal screw	X
X				Check the mobrey valve float is operational	X
X				Check the hourly log book and compare results from previous day	X
X				Check condition of the exhausted through the chimney and report any fugitive emissions.	X

Frequency				Recommended test	Accomplished By			
Daily	Weekly	Monthly	Quarterly		Yearly	Boiler Operator	Service Technician	Checked
X					X			
X				Check coal soot blower if it is clean or dirty	X			
X				Check the rate at which the CO ₂ is exhausted	X			
X				Check dirt and cladding	X			
X				Check the delivery pressure (hot or warm water)	X			
X				Check the steam pressure to the calorifier and the warm water temperature from the calorifier.	X			
X				Check the hot water circulation pumps	X			
X				Check the condition of the gearbox which controls the stoker	X			
X				Check the rate at which the coal is delivered into the boiler	X			

X				Check the type of coal if it's within the specification as stated by the department.	X
X				Observe condition of the flame	X
X				Check all relief valves for any leaks	X
X				Check water level control	X
X				Inspect boiler for air leaks. Check damper seals	X
X				Inspect all linkages on combustion air dampers and fuel valves	X
X				Check pilot and burner assemble. Clean pilot and burner following manufacture's guidelines. Examine for mineral or corrosion buildup	X

				Frequency			Accomplished By		
Daily	Weekly	Monthly	Quarterly	Yearly	Recommended test	Boiler Operator	Service Technician	Checked	
	X				Inspect system for water/steam leaks and leakage opportunities. Look for leaks, defective valves and traps, corroded piping and condition of insulation	X			
		X			Inspect steam supply and condensate return piping	X			
		X			Inspect the boiler relief valve and the relief valve discharge pipe for signs of weeping or leakage	X			
		X			Check blow-down and water treatment procedures in order to determine if blow-down is adequate to prevent solid buildup	X			

X	Measure and compare last month's readings flue gas composition over entire firing range	X
X	Inspect all boiler insulation and casing for hot spots.	X
X	Check combustion air intake to boiler room and boiler to make sure openings are adequate and clean	X
X	Check V-belts for proper tension. Check packing glands for compression leakage	X
X	Check pressure gauge, pump, filters and transfer lines. Clean filters as required	X
X	Check for air leaks around access openings and flame scanner assembly	X
X	Check all blower belts for tightness and minimum slippage	X
X	Check all gaskets for tight sealing, replace if do not provide tight seal	X
X	Perform water quality test for proper chemical balance.	X
X	Check for proper operation valves (Pressure reducing/regulating)	X
X	Thoroughly inspect heating system and address any problems	X
X	Inspect and clean the boiler heat exchanger	X

Frequency				Recommended test	Accomplished By			
Daily	Weekly	Monthly	Quarterly		Yearly	Boiler Operator	Service Technician	Checked
				X	Check bracket and the lagging on steam delivery pipes	X		
				X	Check all boiler wiring and connections	X	X	
				X	Inspect condensate system and clean and flush as necessary	X		
				X	Check water PH level	X		
				X	Inspect condensate system and clean and flush as necessary	X		
				X	Inspect and clean burner assembly	X		
				X	Inspect venting system for blockage, corrosion or deterioration and ensure all joint and pipe connections are tight	X		
				X	Inspect air inlet and vent terminations to ensure they are clear and unobstructed	X		
				X	Check control setting and test operating and safety controls	X		
			X		Check oil preheaters by removing the heating element and inspect for sludge or scale	X		
			X		Repair refractory. Immediately upon opening the fireside, give the refractories an inspection and repair necessary	X	X	
			X		Check pump coupling alignment. Check alignment to ensure the tolerance are within the manufactures recommendations	X		
			X		Reset combustion. The entire combustion process should be	X		

		Frequency			carefully checked, Oxygen readings taken and necessary burner adjustment made	Accomplished By				
		Daily	Weekly	Monthly		Quarterly	Yearly	Boiler Operator	Service Technician	Checked
					Recommended test					
				X	Inspect mercury switches. Inspect mercury switches for contamination, loss of mercury, and crack or broken wires. Replace if necessary			X		
				X	Check for proper boiler operation after it has been cleaned and inspected			X		X
				X	Check if tubes are blocked and if so clean them as part of the shutdown procedure			X		X
				X	Clean water side surface by following manufacture's recommendation on cleaning and preparing water side surface			X		
				X	Clean fire side by following the manufacture's recommendation on cleaning and preparing fire side surface			X		
				X	Inspect and repair refractories on the fire side. Use recommended material and procedures					X
				X	Remove and recondition or replace relief valve depending on their condition			X		
				X	Clean and recondition feed-water pumps. Clean condensate receivers and deaeration system			X		
				X	Check operation and repair any hydraulic and pneumatic valves			X		
				X	Conduct Eddy current test in order to assess tube wall thickness					X

Client Department Sign-off: Name:	
Date	

STAMP

4.1

FOR DEPARTEMENTAL USE (DPW)

<input type="checkbox"/>	State
<input type="checkbox"/>	Hire
<input type="checkbox"/>	Inspection
<input type="checkbox"/>	Telephonic confirmation by: _____
	Number: _____

4.2

FOR DEPARTEMENTAL USE (DPW)

The work has been done

Signature: _____

Name: _____

Designation: _____

Date: _____

ANNEXURE C: PLANNED JOB OBSERVATION TEMPLATE

PLANNED JOB OBSERVATION REPORT			
1. NAME(Observed Person):	2. DEPARTMENT:	3. DATE:	
4. OCCUPATION:			
5. REASON FOR OBSERVATION:			
Incident Follow-up	Significant Job	Performance check	
Training	Training follow-up	Other	
6.	COULD ANY OF THE PRACTICES OR CONDITIONS OBSERVED RESULT IN HARM TO PEOPLE, PROPERTY OR THE ENVIRONMENT?	YES	NO
7.	WERE THE METHODS AND PRACTICES OBSERVED THE MOST EFFICIENT AND PRODUCTIVE?	YES	NO
8.	DID THE PRACTICES YOU OBSERVED COMPLY WITH EXISTING WORK INSTRUCTIONS AND PRACTICES?	YES	NO
9.	COULD ANY OF THE PRACTICES YOU OBSERVED HAVE A DETRIMENTAL EFFECT UPON THE QUALITY OF THE PRODUCT AND IMPACT ON THE ENVIRONMENT?	YES	NO
10.	DESCRIBE CLEARLY BELOW ANY PRACTICES OR CONDITIONS RELATED TO ITEMS ABOVE THAT DESERVE COMPLIMENT OR CORRECTION.		
11.	SHOULD A FOLLOW-UP OBSERVATION OF THIS WORKER OR JOB BE MADE IN THE NEAR FUTURE?	YES	NO
12.	DESCRIBE ANY FOLLOW-UP ACTIONS THAT SHOULD BE CONSIDERED FOR CHANGE IN THE INTEREST OF OHSE		
13.	Employee NO.		

14. OBSERVER / TRAINER

NAME: _____ TITLE: _____ SIGNATURE: _____

EMPLOYEE/TRAINEE

NAME: _____ TITLE: _____ SIGNATURE: _____

SUPERVISOR/TEAM LEADER:

NAME: _____ TITLE: _____ SIGNATURE: _____

ANNEXURE D: SAFE WORK PROCEDURE/METHOD (SWP)

Maintain Safety Devices (Mechanical)

NO.	STEPS TO BE FOLLOWED	RISK INHERENT TO STEP	PREVENTATIVE SAFETY STEP	PLANNED JOB OBSERVATION	
				PREVENTATIVE SAFETY STEP FOLLOWED Y/N	REMARKS
1.	Always wear correct safety equipment				
2.	Trained competent persons shall only maintain safety devices.				
3.	Clean examine the device for defects, visible damage or any deformity				
4.	Stop and lockout all moving machinery whilst carrying any work or adjustments				
5.	Replace any defective parts or units without delay.				
6.	Ensure that all devices are secured properly				
7.	Ensure that the flame-proofness of any machine is not impaired by using any other type of device not covered by the G.M.E certificate of approval and no alterations shall be made to invalidate this approval				

Planned Maintenance Schedule

NO.	STEPS TO BE FOLLOWED	RISK INHERENT TO STEP	PREVENTATIVE SAFETY STEP	PLANNED JOB OBSERVATION	
				PREVENTATIVE SAFETY STEP FOLLOWED Y/N	REMARKS
1.	Always isolate and lockout equipment before carrying out any P.M. schedule where applicable.	Serious injury to employees.	Train all employees on the use of lockout procedures. Enforce as per standard procedure.		
2.	Always park mobile equipment in a safe and level place.	Run away.	Use park brakes. Stop blocks. Lower F.E.L buckets to touch ground.		
3.	Ensure that grease nipples, etc. are clean before lubricating.	Damage to equipment e.g. bushes and bearings.	Over inspection. Specific lubrication training.		
4.	Always ensure proper support where necessary.	Serious injury to employees. Damage to equipment.	Over inspection. Proper designed supports.		
5.	Always carry out maintenance according to P.M. schedule.	Injury or damage to employees or equipment.	P.M schedules to be posted on notice boards Accessible to all maintenance and operating staff.		
6.	Test equipment before commissioning.	Injury or damage to employees or equipment.	Over inspection. Check Amp meter readings.		
7.	Always ensure to have the correct material and equipment available before starting P.M. schedule.	Prevent production time loss. Injury to employees and or equipment.	On the job training. Over inspection.		

8.	Always clean area and store equipment after job completion.	Injury to employees due to superfluous tools or materials.	On the job training. Over inspection. Disciplinary procedure.		
9.	Always ensure that all guards, covers and panel doors are properly supported and secured during and after maintenance.	Serious injury to employees, Multiple injuries.	Safe work procedures. On the job training. Over inspection.		
10.	Always use the correct tools and equipment for the job.	Hand injuries.	Follow SWP. On the job training. Over inspection. Disciplinary procedure.		
11.	Always wears correct protective clothing.	Injury or damage to employees and equipment.	Follow SWP. Training on the limitations of P.P.E.		
12.	Always report any defects that cannot be rectified immediately.	Injury or damage to employees and equipment.	Report to head of department. Immediately.		

Loading and Unloading Equipment

NO.	STEPS TO BE FOLLOWED	RISK INHERENT TO STEP	PREVENTATIVE SAFETY STEP	PLANNED JOB OBSERVATION	
				PREVENTATIVE SAFETY STEP FOLLOWED Y/N	REMARKS
1.	Always wear correct protective equipment.	Injury to employees usually serious.	Specific training. Over inspection. Disciplinary procedures.		
2.	Ensure never to exceed the capacity of lifting equipment when loading.	Permanent damage to lifting equipment. Injury in case of breakage to employees.	On the job training. Over inspection. Disciplinary procedures.		
3.	Always estimate the load prior to lifting.	Permanent damage to lifting equipment. Injury in case of breakage to employees.	Follow equipment manual recommendations.		
4.	The preferred angle between the legs of the sling is from 50-90 degrees. A wider angle creates additional stresses in the sling legs.	Permanent damage to lifting equipment. Injury in case of breakage to employees.	Specific training. Over inspection. Disciplinary actions.		
5.	Ensure correct balancing of load as off-center loading can be dangerous.	Load can slip sideways, causing injury or damage to employees and equipment.	Specific training. Over inspection. Disciplinary actions.		
6.	Always lift load slowly to enable sling to adjust itself to the load without creating undue shock	Weakening of slings. Injury or damage to employees and equipment.	Specific training. Over inspection. Disciplinary actions.		

	loads.				
7.	Ensure to use hand signals when using a crane.	Prevent accidents normally serious.	Specific training. Over inspection. Disciplinary actions.		
8.	Always secure material properly before transporting.	Injury or damage to employees or equipment.	Specific training. Over inspection. Disciplinary actions.		
9.	Always ensure to have ample room when loading or unloading equipment.	Restricted maneuverability can cause injury or damage.	Over inspection.		
10.	When unloading equipment without lifting equipment use shock absorbing material e.g. Tyres.	Injury or damage to employees or equipment.	On the job training. Over inspection.		

Remove and Replace Sub-Assembly

NO.	STEPS TO BE FOLLOWED	RISK INHERENT TO STEP	PREVENTATIVE SAFETY STEP	PLANNED JOB OBSERVATION	
				PREVENTATIVE SAFETY STEP FOLLOWED Y/N	REMARKS
1.	Always wear correct PPE.	Injury to employees	-Monthly checklist (PPE) - Over inspection		
2.	Stop, isolate and lockout the power.	-Injury to employees _ -Damage to equipment	-On the job training (Lock out procedure) _ -Over inspection		
3.	Disconnect hydraulic hoses, electric cables, water and lubrication pipes where applicable	Pollution _ Electrical short circuit (fire hazard) _ Confined space entry	Specific on the job training _ Over inspection		
4.	Plug all hydraulic hose ends to prevent the ingress of dirt and oil spillage.	-Damage to company equipment _ Confined space entry	Proper on the job training _ Over inspection		
5.	Ensure that the unit is properly supported and remove all mounting bolts.	Falling objects _ Damage to company equipment _ Confined space entry	Proper on the job training _ Over inspection		
6.	Remove the subassembly by proper means and leave it at the designated place for despatch.	-Lifting equipment - Falling Objects _ Confined space entry	-Specific lifting equipment -Training - Over inspection		
7.	Install the replacement unit, line it up, insert all mounting bolts and tighten.	-Lifting equipment -Falling objects - Confined space entry	-Over inspection - Specific lifting equipment - Training		
8.	Reconnect all hydraulic hoses, electric cables, water and lubrication pipes where applicable	-Pollution - Electrical short-circuits - Fire hazard	-Specific on the job training - Over inspection		

		- Confined space			
9	Restore the power and test the unit	-Injury to employees Damage to company equipment	Over inspection		

V-belt changing

NO.	STEPS TO BE FOLLOWED	RISK INHERENT TO STEP	PREVENTATIVE SAFETY STEP	PLANNED JOB OBSERVATION	
				PREVENTATIVE SAFETY STEP FOLLOWED Y/N	REMARKS
1.	The appointed and authorized person may only carry out task.	Injury or Damage	Appointed person only has access		
2.	Notify all teams of time HT will be switched on or off	Injury or Damage	Verbal communication		
3.	Unlock substation doors and keep open.	Hindered Exit	Hold doors open by physical means.		
4.	Enter in Log book	Loss of history/trends	Write in manually		
5.	Ensure "Buddy" present.	Delay in treatment or help	Work in pairs		
To re-set Oil-filled circuit breaker (OCB)/ Circuit breaker (CB)					
6.	Test for power	Damage or injury	Use 11kv tester		
7.	Identify Breaker	Damage or injury	Visual confirmation		
8.	Reset alarm on panel	Damage or Injury	Manual/Physical task		
9.	Switch off all fuse switches in Substation	Damage or Injury	Manual/Physical task		
10.	Put on Flash Suit	Injury	Physical task		
11.	Charge spring with handle	Damage or injury	Manual/Physical task		
12.	Push handle down to close breaker	Damage or Injury	Manual/Physical task		
13.	Switch all fuse switches on	Damage or Injury	Manual/Physical task		
14.	Test for power	Damage or injury	Use 11kv tester		

15.	Notify all teams HT is switched on.	Injury or Damage	Verbal communication		
To Switch off OCB/CB					
16.	Identify Breaker	Damage or injury	Visual confirmation		
17.	Press off button to trip OCB	Damage or injury	Visual confirmation		
18.	Test for power	Damage or injury	Use 11kv tester		
19.	Unlock OCB	Damage or injury	Manual/Physical task		
20.	Rack switch down to earth	Damage or injury	Manual/Physical task		
21.	Pull carriage out of frame	Damage or injury	Manual/Physical task		
22.	Test cable side of OCB for power	Damage or injury	Manual/Physical task		
23.	Notify all teams HT is switched off.	Injury or Damage	Verbal communication		
24.	Close substation doors and lock				

Working in Confined Spaces

NO.	STEPS TO BE FOLLOWED	RISK INHERENT TO STEP	PREVENTATIVE SAFETY STEP	PLANNED JOB OBSERVATION	
				PREVENTATIVE SAFETY STEP FOLLOWED Y/N	REMARKS
1.	<p>Ensure that the confined area is safe to enter.</p> <p>If a possibility exists that toxic/ flammable gasses are present, tests must be conducted by a person with the knowledge and instruments</p>	<p>Sickness</p> <p>unconsciousness</p> <p>Injury to workers</p>	<p>Inspections</p> <p>Specialists/ experts</p> <p>First aid</p>		
2.	<p>Purge the confined space with ventilation if uncertain with how safe is the area</p>	<p>Inhalation of gasses and fumes</p> <p>Disease</p> <p>Fire</p>	<p>Emergency procedure</p> <p>First aide</p> <p>Fire procedure</p>		
3.	<p>If the atmosphere cannot be cleared, proper breathing apparatus must be worn by the person entering the confined space</p>	<p>Inhalation of gasses and fumes</p> <p>Disease</p> <p>Fire</p> <p>unconsciousness</p>	<p>Emergency procedure</p> <p>First aide</p> <p>Fire procedure</p>		