Eskom	**SOW**	**Camden Power Station**

Title: **WTP Sand Filter Refurbishment**

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Compiled by	**Supported by**	**Functional Responsibility**	**Authorized by**
N. Naidu	**O. Tilodi**	**M. Ngubeni**	**M. Mathabatha**
Auxiliary Plant System Engineer	**Auxiliary Plant Engineering Manager**	**Auxiliary Plant Maintenance Manager**	**Engineering Manager**
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Content

1. Introduction

The sand filters are the final stage of the raw water pre-treatment process, downstream of the clarifiers and prior to the potable and demineralised water production stages. Sand filters remove any flocculant that was carried over from the clarifiers. Camden's Water Treatment Plant (WTP) has six sand filters divided into two banks (east and west) which can be isolated to function separately if maintenance is required. Filters 1, 3 and 5 are on the west side and filters 2, 4, 6 are on the east side.

The WTP sand filter nozzle bases, inlet valves and covers are in urgent need of repair/refurbishment.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

Refurbishment of the WTP sand filter nozzle bases, inlet valves and covers.

Raw Water Design Information:

- Medium: Raw Water (clarifier outlet/sand filter inlet)
- Raw Water Quality:
  - pH - 6 – 8
  - K_{25} - 50 – 150 µS/cm
  - Na - 10 – 40 ppm
  - SiO_2 - 5 – 15 ppm
  - Mg - 5 – 100 ppm as $CaCO_3$
  - Cl - 1– 6 ppm
  - SO_4 - 5 – 25 ppm
- Temperature: -10°C to 40°C

2.1.2 Applicability

- Auxiliary Plant Engineering
- Auxiliary Plant Maintenance
- WTP Operations

2.1.3 Effective date

See date of authorized signature

2.1.4 Normative References

- 240-101712128 - Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with linings
- 240-106628253 - Standard for Welding Requirements on Eskom Plant
- 240- 105020315 - Eskom Standard for Low Pressure Valves
- 240- 83539994 - Standard for Non-Destructive Testing (NDT) on Eskom Plant
- 240- 56364545 - Structural Design and Engineering Standard
- ISO 12944 - Paints and Varnishes - Corrosion Protection of Steel
- ISO 146 - Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles
- EN 13480 - Metallic Industrial Piping
- OHSA amendments - Occupational Health and Safety Act South Africa No 85 and

2.1.5 Informative References

- N/A

2.2 Definitions

N/A

2.3 Abbreviations

BS	British Standard
NDT	Non-Destructive Testing
QCP	Quality Control Plan
SOW	Scope of Work
WTP	Water Treatment Plant

2.4 Process for Monitoring

N/A

2.5 Related/Supporting Documents

N/A

3. Scope of Work

The following scope of work for the WTP Sand Filter Refurbishment repairs will include refurbishment of the WTP sand filter nozzle bases, inlet valves and covers.

NB. The Contractor shall take note and make provision that there will be a time delay between the availability of the sand filters in order to ensure continued demin and potable water production. One sand filter will be available at a time to conduct the refurbishment/repairs. The next or following sand filter will only be available once a refurbished sand filter has been refurbished and commissioned. Eskom will advise on the order of repair based on plant availability and conditions.

3.1 Pre-Preparation:

- Ensure that a risk assessment is compiled with all relevant stakeholders present.
- Contractor to ensure all equipment required to isolate and rig out the valves is available and on site.
- Contractor to supply new rubber gaskets, bolts and nuts.
- The Contractor will be expected to supply two spare isolation valves inclusive of drawings and casting mould.
- All material used should be corrosion resistant and suitable for the water quality stipulated above.
- Material Data Sheet and 3.1 cert to be supplied to the Client prior to execution.
- A bill of material must accompany the as-built drawing.
- Once a detailed repair SOW is concluded, the Contractor must supply necessary QCP and Welding Procedures (if welding is required) for approval prior to commencement.

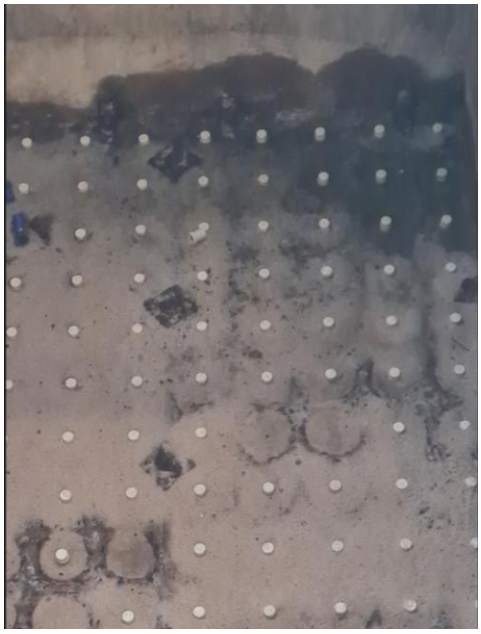
  NB. If welding is required for the execution of any portion of this scope, then the following is applicable:

  - All welding will be in line with the requirements of the Eskom welding requirements document 240-106628253 Standard for Welding Requirements on Eskom Plant.
  - All preps must be NDT as per Welding Procedure.

    NB. NDT's to be conducted by an Eskom approved NDT company.
  - All fit-up inspections must be conducted by Welding Inspector.
  - All final welds must be NDT as per 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant.

3.2 Sand Filter Nozzle Base Refurbishment

- Sand Filter base dimensions:
  - Length ±3.6m
  - Width ±4.1m
- The sand filter base is fitted with nozzles as per the picture below:

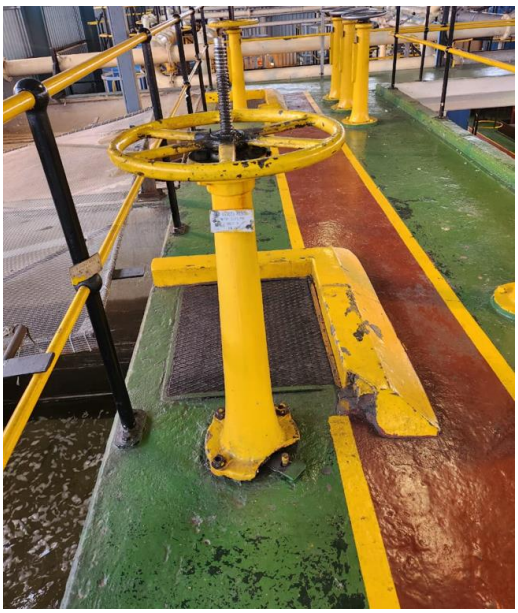
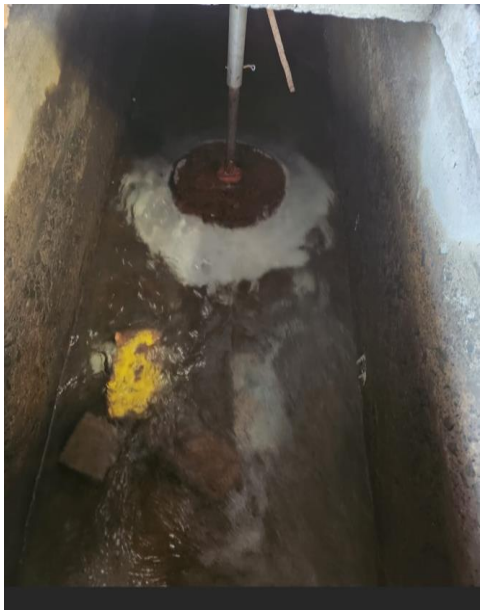


- The nozzles have a threaded end which screws into a threaded base which is imbedded into the sand filter floor. The threads on the embedded base are worn out and therefore the nozzles cannot be secured onto the sand filter floor. The Contractor is to repair/replace the sand filter embedded bases in order to ensure that the nozzles can be secured into the sand filter floor. The Contractor will also be required to inspect and replace any damaged nozzles.

  NB. Replacement nozzles will be supplied by Eskom (if required).

3.3 Refurbishment of Sand Filter Inlet Valves (Adhere to Eskom standard 240-105020315):

- Each sand filter is fitted with the following inlet valve:

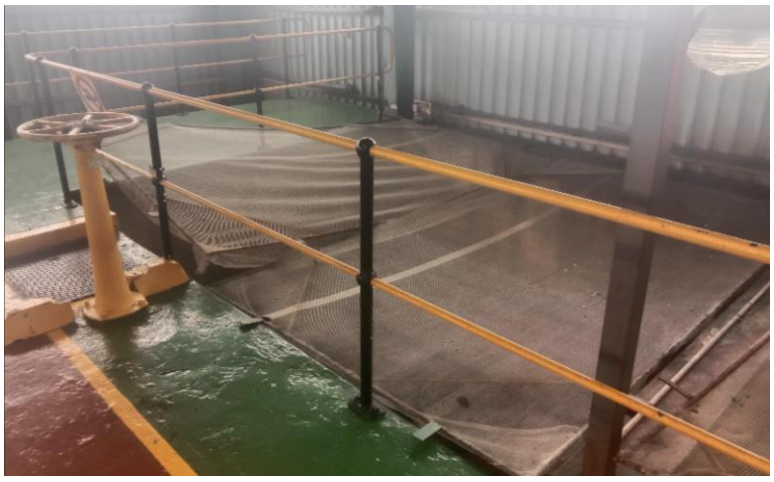
- The inlet valves are passing and the Contractor will be responsible for refurbishing/repairing the inlet valves and conducting any repair to the civil structure to ensure complete isolation when the valve is closed.
- Remove and refurbish the following valves:
  - 00GDB10AA501
  - 00GDB20AA501
  - 00GDB30AA501
  - 00GDB40AA501
  - 00GDB50AA501
  - 00GDB60AA501

  NB. The valves may be sent away for full refurbishment. Once the valves are removed from position, an Eskom engineer and the Contractor will have to first inspect, discuss and agree on the repair/refurbishment scope before the valves are removed from site.
- Remove the valves from installation location.
- Disassemble the valves.
- Clean all components for the Engineer and Contractor's inspection, sandblast to approved specification for inspection and coating.
- Replace defective components in accordance to the inspection findings, approval from site Engineer required.

- Arrange for corrosion protection of the valve internal and external (done by valve repairer) as per 240-101712128 - Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with linings.
- Assemble the valve.
- Carry out a seat leakage test (BS EN 12266-1, Rate A).
- All gaskets and o-rings to be selected by repair to prevent system leakages.
- Install the valves.
- Commission valve and check for leaks.

3.4 Sand Filter Covers:

- Sand Filter dimensions:
  - Length ±3.6m
  - Width ±4.1m
  - Depth ±3m
- The sand filters are currently fitted with net covers to prevent ingress of foreign debris as per the picture below:



- However, these covers are not practical as they do not allow for easy access for Operating and Maintenance purposes. The frames are too heavy and need to be manually lifted. The Contractor is to install sand filter covers that will meet the following criteria:
  - Be transparent to allow visibility into the sand filter
  - Be easily removable to allow for Maintenance
  - Be designed in such a way to prevent ingress of foreign particles and allow for easy cleaning of the cover

  NB. Potential cover options to be submitted to Eskom for approval and acceptance prior to procurement/fabrication and installation.

4. Acceptance

N/A

5. Revisions

Date	Rev.	Compiler	Remarks
January 2024	1	N. Naidu	Original Issue

6. Development Team

Jeffrey Nkuna

7. Acknowledgements

N/A