

## PLETTENBERG BAY WATER TREATMENT PLANT: PROVISION OF TWO ADDITIONAL FILTERS: MECHANICAL & ELECTRICAL EQUIPMENT - Contract SCM/94/2015/ENG

SUMMARY OF WORKS	
Type of Works	Water Treatment Works
Location of Works	Bitou Municipality
Size of Works (M <sup>3</sup> /DO)	10 ML/D
Date Of Award	7 August 2015
Date Completed	29 June 2017
Completion Value Including VAT)	R 7 355 371.11
Client	Bitou Municipality
Conditions of Contract	FIDIC GCC 2004

The purpose of the extensions to the Plettenberg Bay WTW is to increase the capacity of the plant from 22 MI/day to 27 MI/day via the construction of two additional rapid gravity filters. These two new filters have been added to the existing type V filters located in Filter Bank 4. The existing three filters (Filters 1 to 3) were constructed in 1999 and provide a filtration capacity of 10 MI/day. The addition of the two new filters (Filters 4 & 5) increase the capacity of Filter Bank 4 to 15 MI/day.

All five filters are automatically controlled via Festo pneumatic actuators. The existing actuators on Filters 1 to 3 have all been replaced with new actuators. New actuators and valves have also been provided for the two new filters 4 & 5. Compressed air to all new actuators is via the new Festo solenoid valve terminal panel located in the upper gallery. A new MCC & PLC control panel has been installed in the lower gallery of Filters 1 to 3 to control the backwash pumps, air scour blowers, and all actuated valves.

The backwash inlets to the three existing filters 1 to 3 are also being changed to new inlets located in sumps at the opposite end of the filters. Air scour and backwash water to the two new filters will be from the existing blowers & backwash pumps serving Filters 1 to 3.

Two new compressors have been installed to provide compressed air for the new actuators located on all five filters. The compressors are housed in a specially constructed dry-wall enclosure located in the new lower gallery under filters 4 & 5.

## Rapid gravity filtration plant

The filter sizing and loading rates for the two new filters (4 & 5) are as follows:-

Filter dimensions	9800mm long x 3700mm wide
Filter area	36.24 m <sup>2</sup>
Design flow to Filter Bank 4 (Filters 1 to 5)	15 Ml/day (625 m <sup>3</sup> /hr)
Design flow per filter	125 m <sup>3</sup> /hr per filter
Filter loading rate at design flow (5 filters running)	3.45 m <sup>3</sup> /m <sup>2</sup> /hr
Filter loading rate when one filter under backwash	4.31 m <sup>3</sup> /m <sup>2</sup> /hr
Filter inlet	200NB butterfly valve + actuator
Filter outlet (modulating)	200NB knife gate valve + actuator
Air scour inlet	200NB butterfly valve + actuator
Backwash inlet	350NB butterfly valve + actuator
Backwash outlet	350NB butterfly valve + actuator

PCI Type K Monolithic filter floors have been installed comprising of pre-manufactured “cast-in-situ” floor panels and nozzle sleeves. The floor panels are supported by an array of columns & beams located at the base of the filter, which also allows uniform distribution of air and water during the filter backwashing sequence. The nozzles are equally spaced at 150mm centres, and have sufficient height adjustment to ensure all nozzles are installed at the same level across the entire filter floor. The filter media provided in the rapid gravity filters is a 1200mm layer of standard silica sand with an effective particle size range of 0.7mm

The Contract commenced August 2015 with Take Over was obtained on the 24<sup>th</sup> June 2016.

The contract sum was approximately seven Million Rand.



**Support columns and beams.**



**Panels Installed**



**Floor cast and stems and domes installed, pre media installation.**