

Biological trickle filtration systems supplied to Ghana

South African EPC contractor in the water and wastewater treatment sector, WEC Projects, has completed the design, engineering and supply of new sewage treatment plants for three different developments in Ghana, all of which include biological trickle filtration systems.

Two new treatment plants, both of which incorporate biological trickle filtration systems, are being installed at hospitals in Ghana: at the Kumawu District Hospital, a new medical facility being built in the Sekyere Kumawu District; and at the Fomena District Hospital, another a new facility located in the Adansi North District. WEC Projects is supplying its Model E trickle filter plant, which is designed to treat an average of 90 m³ per day, for both hospitals.

Raw sewage is fed into the plant's screenings box before arriving at the three-chamber below ground septic tank where anaerobic pre-treatment takes place. The wastewater then flows into a recycle sump equipped with vortex pumps with a transfer rate of 25 m³ per hour across the trickle filter. The trickle filter itself is housed in two above-ground double stacked 12 m containers.

The wastewater flows down through trickling filter media. On the surfaces of this media, a biofilm is propagated, which used to break down COD and to remove ammonia through nitrification of the wastewater. The wastewater is then collected in a basin at the bottom of the packing media and transferred to the clarifier.

A splitter box returns some of the wastewater to the trickle filter to ensure a continuous flow through the bioreactor. Phosphorous is removed from the wastewater by introduc-



The trickle filter plant being installed at the Kumawu District Hospital. The trickle filter itself is housed in two above-ground double-stacked 12 m containers.

ing ferric chloride to the clarifier. The water then undergoes disinfection using chlorine to meet the required effluent standards before being discharged into the environment.

All process control instrumentation and electricians are housed in a six-metre shipping container and the self-contained plants are fully fabricated in South Africa.

In addition to the two hospitals, a third smaller system is being installed in an apartment complex in the coastal city of Sekondi-Takoradi. This system has a current flow rate of 16 m³ per day of effluent, which will increase once it reaches its peak flow rate. It also features a trickle filter system similar to those of the two hospitals, although on a smaller scale, in a standalone tower.

The plant will treat domestic wastewater

and has been designed to blend into the aesthetics and colour of the apartment complex design and to reduce its overall footprint and avoid contact with nearby overhead power lines.

Says Ashly Forster, Project Manager at WEC Projects, "As these are new plants, the initial flow rate of untreated sewage will be low due to the low occupancy. This will build up over a short time, allowing the plants to operate more effectively as the biofilm on the trickle filters begins to propagate."

"A five-person team from WEC Projects oversaw the installation of the plants and provided training to operators during the commissioning stage. Trickle tower technology was chosen for these projects because of its scalability, low maintenance, operating requirements, and simple design," he says.

"A single operator can oversee and control the plant, which is extremely reliable with a long operating lifespan. Making sure that these plants remain operating efficiently is particularly important in order to ensure that no untreated wastewater enters the environment. Our WEC Assist division will also offer operations and maintenance services where necessary, as well as chemicals, consumables and spares when required," Forster concludes.

WEC Projects is a leading South African EPC contractor specialising in full turnkey water treatment solutions for the food and beverages, mining, and pulp and paper industries. The company offers innovative solutions for renewable energy, sludge beneficiation and zero liquid discharge, designed to meet clients operational, environmental and sustainability goals.

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The Model E biological trickle filtration plant during installation at the Fomena District Hospital in the Adansi North District, Ghana, will treat 90 m³ of sewage per day.