

CASE HISTORY

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TOVEKO Filters

Kingsbarns Wastewater Treatment Works



Kingsbarns Wastewater Treatment Works is located on the north east coast of Scotland, next door to the famous St. Andrews golf course. When the plant was built in 2005 it was required to include UV treatment prior to discharging the treated wastewater to the sea. Also, being in a very sensitive location, the whole plant was required to be built below ground, with nothing higher than 1.2m above ground level.

It was therefore necessary to ensure that the sand filter preceding the UV unit could be located below ground without huge cost, and preferably without the need to pump into the filter from the secondary treatment stage.



The sand filter is located below the long rectangular cover

The design Basis for the Sand Filter is shown in the table below:

	Filter feed	Filter discharge
Flow Rate:	20m ³ /h max.	
Suspended Solids:	30mg/l max.	10mg/l (95%ile)

The twin problems of both the height above ground and the avoidance of pumping were solved by installing a TOVEKO continuous gravity sand filter in an underground chamber. TOVEKO filters are only 2.3m high, and therefore the chamber needed to be only 2.6m deep, minimising the cost of civil work. Once simple GRP lids were installed above the filter, the well looked as unobtrusive as any other part of the plant.

Having the filter installed in a chamber with a simple access ladder enables normal routine maintenance to be simply and conveniently undertaken under cover, which is obviously a bonus in wet weather as far as the operators are concerned – far better than having a climb a 6 or 7m high tower in the wind and rain as is the case with most continuous gravity sand filters. The ease of removal of the GRP covers enables easy access for any non-routine maintenance tasks in the future.



The model S-300 filter installed with the GRP covers removed

The TOVEKO filter is constructed in 304 grade stainless steel and will not therefore require painting throughout its life. It is also fully automatic in operation to the extent that the air-lifts and sand washers react automatically to changes in incoming flow rate and solids load by starting, stopping, increasing and decreasing the rate of sand washing automatically. This makes the filter very flexible and low maintenance. The unique sand washing system also helps the filter to cope with sticky solids. This is very unusual, since the sand washers used in most sand filters are not capable of removing sticky solids such as excess polymer or oil from the filter sand and, consequently, just block up. The dirty wash water produced by the filter peaks at 1.2m³/h (6% of design service flow) when washing sand at the maximum rate. However, under normal operating conditions, the wash water flow is 0.6m³/h, or 3% of maximum service flow. This flow is fed directly back into the preceding secondary treatment stage for re-settlement.

Overall, the TOVEKO filter provides an economic, environmentally-sensitive and low-maintenance solution for tertiary filtration requirements

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