

## Swansea Waste Water Treatment Works - Case Study



### Swansea WwTW

- 112,000m<sup>3</sup>/day DAF Plant
- PE 225,000
- Value £2,499,000
- Build Date; 2013/2014

#### Process Description:

In order to meet a tightened discharge consent, 12 no. existing secondary lamella tanks were converted to DAF (Dissolved Air Flotation) units – achieving an effluent total suspended solids of 30mg/l and BOD of 25mg/l. The required operational number of units was 11 no., but the DAF process is designed to be capable of achieving full effluent compliance at full works flow allowing one unit to be out of service for maintenance.

The DAF process takes flows from the upstream MBBR process. Flow reaches the DAF tanks via a flow distribution channel into individual feed pipes. The feed pipes incorporate a spin mixer into which whitewater is injected under pressure from individual saturation vessels.

Feed and whitewater are mixed at the inlet to the DAF tank and equally distributed across the width of the tank by the inlet baffle. When the air-saturated water is released, micro bubbles are formed. Chemical, physical and electrical forces cause colloids to attach to one another and to air bubbles. These particle flocs float to the surface and are scraped off. Flow paced polymer dosing is used to enhance the process.

A co current surface chain and flight scraper removes excess sludge to sludge hoppers from where it is removed. Any settling flocs are collected in bottom hoppers which periodically are manually drained. Clear effluent underflows the sludge hopper baffles before reaching the outlet weir boxes.

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Description	Value
Dissolved Air Flootation	£2.5m
Current Status	Commissioned & Fully Operational
Client	Imtech <span style="float: right;">End User: Welsh Water</span>
Market Type	Municipal
Population Served	225,000 population equivalent
Flow	112,000 m <sup>3</sup> /d Peak Flow <span style="float: right;">65,813 m<sup>3</sup>/d Average Day Flow</span>
Consent/Permit	25:30 <span style="float: right;">BOD:SS</span>
Brief Description	Convert 12 no. existing Lamella lanes to 11 no. DAF lanes

Part of the final effluent flow is re-cycled to the saturation vessel where water is saturated with compressed air to produce white water.

Flows of 130 l/s per tank is a 'maximum feed flow' and flows of 170 l/s per tank are 'peak feed flow'. Flows below 130 l/s are within the normal operating range. Flows between 130 l/s and 170 l/s are to allow for difficulty of feed flow equalizing.

The system passes a peak flow at given headloss through the DAF tank, producing a required quality effluent from the individual tank at maximum flow; and from the whole

plant with minimum ten tanks online, having only some tanks close to 170 l/s with at the same time others below 130 l/s (with linear distribution of flows between tanks around average).

As such with satisfactory flow splitting, the plant is designed to treat FFT with one tank off line for maintenance and without compromising the effluent standard.

The contract was awarded to Jacopa in January 2013 and due to protracted interface with existing works process was completed in June 2015.

