



Urban Waste Water Treatment Plant in Sitges – Barcelona

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The purpose of this installation is to treat the waste water produced by the cities of Sitges and St Pere de Ribes. The type of biological treatment used is the A2O process, a variation of the conventional activated sludge process.

Location	Sitges (Barcelona)
Owner	Junta de Sanejament de la Generalitat de Catalunya
Duration	12 months
Capacity	8,000 to 18,000 m ³ /day
Population	108,000 eq-inhabitants

The detected levels of contamination are the following:

	Inlet	Output
BOD ₅	180 mg/l	12 mg/l
SS	200 mg/l	15 mg/l

Water Line

The average daily flows to be treated vary from 8,000 m³ in winter to 18,000 m³ in the summer so that the treatment plant has been designed to operate with a single water line or with the two with which is equipped, depending on the season. The maximum pretreatment capacity is 3,750 m³/h and primary decanting and biological treatment can handle up to 1,200 m³/h.

The water line starts at the inlet pipe with fine screening carried out using two 3 mm pass screens. There are then two rectangular sand and grease removers with pre-aeration to demulsify the grease, including the equipment for extracting and washing the sand and for concentrating the extracted grease and floating material.



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Finally, the flow is measured in a Parshall type channel.

Primary sedimentation is carried out in two circular units, 25 m in diameter, equipped with purging and pumping of sludge and excesses.

The type of biological treatment used is the A2O process, a variation of the conventional activated sludge process with a previous anaerobic selector, which consists in a process that guarantees excellent results in BOD elimination, and that also removes phosphorous.

The process has been installed in two tanks of 2.059 m³ each, following a two-stage sequence: anaerobic (2 chambers), and oxic (3 chambers). The dimensions of each line are 31.20 x 15 x 4.40 m, adding up to a total volume of 4,118 m³. The air required by the process is supplied from five soundproofed rotary blowers and air is injected into the liquor mix with elastic membrane diffusers.

The biological treatment is completed with the recirculation pumping of the active sludge.

Secondary sedimentation consists of two units 28 m in diameter with purging and pumping of sludge and excesses. Once clarified, the water passes to the outfall through the flow measurement.

Sludge Line

The sludge line consists of a gravity thickener 11 m in diameter for the primary sludge, a flotation thickener 8 m in diameter for the biological sludge and a mixing chamber to homogenise it before pumping to the digestion area.

The anaerobic digestion of the thickened sludge is carried out in two stages, a primary one of 3,300 m³ and a secondary one of 372 m³, the former being equipped with a biological gas stirring system using lances and compressors and the heating of sludge with boilers and heat exchangers. The digested sludge is dried in centrifuges with a system to treat the sludge with polyelectrolyte and to remove it to the storage silo using a screw and pumps.

Gas Line

The gas line consists of a membrane gasometer of 780 m³ to make use of the biological gas produced and a flare for burning off excess gas.

These installations are completed with other auxiliary ones that allow and facilitate the conditions for the operation and necessary maintenance in a treatment station with these features.