

Enlargement of the Wastewater Treatment Plant for Industrial Alcalá Oeste - Madrid

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Location	Madrid
Customer	Canal de Isabel II
Construction period	16 meses
Capacity	74,818 m³/day
Population	374,090 e.i.

The need to carry out the extension work for the purification station has arisen as a result of the increase in flows and contamination, which have exceeded the forecasts of the initial project, leading to a lack of capacity to adequately treat the waste from the urban centre and the industrial zones of Alcalá Oeste, Meco and Camarma de Esteruelas.

Next, we are going to describe the construction process elements that due to their importance, singularity, innovative character, etc, make the project interesting.

The following pollution levels were established as a starting and final basis:

	Design conditions	Average conditions
BOD ₅	330 mg/l	300 mg/l
DQO	666 mg/l	600 mg/l
SST	461 mg/l	300 mg/l
NTK	30 mg/l	30 mg/l
P	7 mg/l	7 mg/l

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Water line

- Improvement and enlargement of the arrival site.
- Dump with sifting for pre-roughing of rainwater spillovers.
- Enlargement of the raw water elevation process (4 pumps of 1153 m³/h at 7.04 m.w.c.).
- Expansion of roughing (New sieve and substitution of existing bars for sieves).
- New pre-treatment building.
- New deodorisation building.
- Expansion of de-sanding and de-greasing in 1 line
- Addition of one line of grit removal and de-greasing channel.
- Improvement of the existing physical-chemical treatment.
- New primary settling tank (32 m diameter).
- Modification of the by-pass.
- Expansion 1 line of biological treatment (total volume of 15,564 m³/h).
- Zonification of all the lines to convert into the A2/O process.
- New secondary settling tank (42 m diameter).

Sludge line

- Replacement of the existing primary sludge and exceeding sludge pumps.
- Complete new primary sludge sifting, including associated building.

- Modification of supply of thickeners and operation of the buffer.
- Start-up of the sludge floater.
- Replacement of existing submersible agitators and thickened sludge pumps.
- Enlargement and relocation of the sludge dehydration unit.
- New sludge anaerobic digestion process.

Slipforms to build the digesters

To assure the water-tightness of the digesters, and future behaviour working at high temperatures, these tanks have been built using the system of sliding formwork and post-stressed concrete, which guarantees the total water-proofness of the apparatus as no type of joint is constructed with this system, and the concreting of the elevations is continuous over the entire height and perimeter.

Enlarging the plant in operation

One of the most important conditioning factors for this Project execution was the large area that this work was going to affect. This implied special work methods for earthmoving, concreting, movement of equipment, etc., as the work was usually taking place next to the foundations of existing installations, which could not stop their continuous purification process.