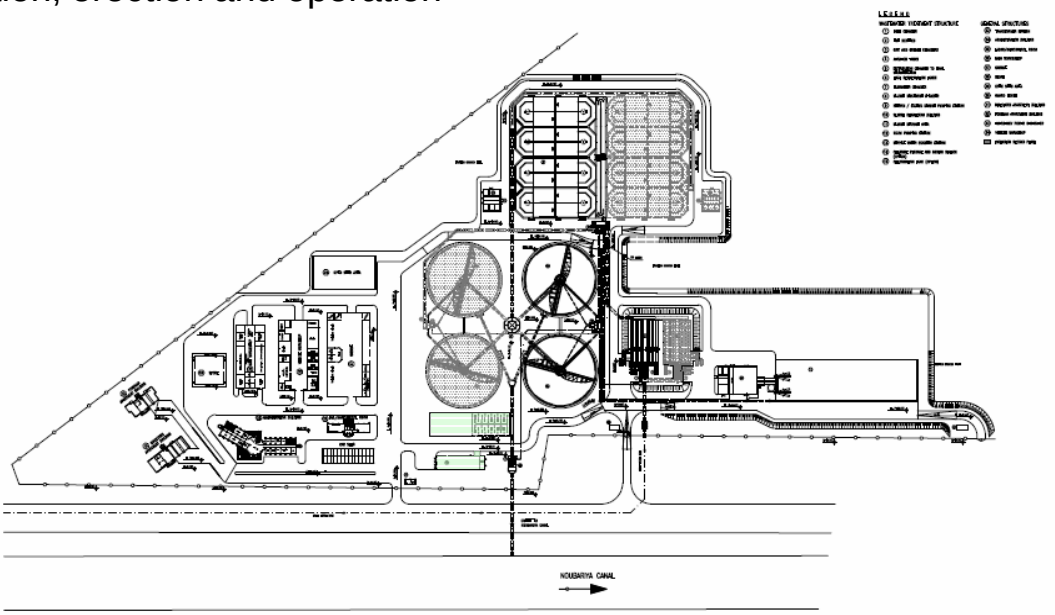
Biological Wastewater Treatment

Alexandria / Egypt

Amriya Sewage Treatment Plant

Turnkey construction, erection and operation



The municipal wastewater in the sewage treatment plant for the Amriya district of the City Alexandria / Egypt is going to be treated by means of mechanical and biological methods.
The Consortium BAMAG / Alexandria Construction Company with Bamag as consortium leader has been awarded the turn key execution of the first phase and ahead of schedule the second phase with subsequent 2.5 year operation of the plant. The plant comprising first and second phase is designed for carbon degradation and further Nitrogen removal for a capacity of 600,000 population equivalents, corresponding a daily dry weather sewage flow of 103,000 m3/d.

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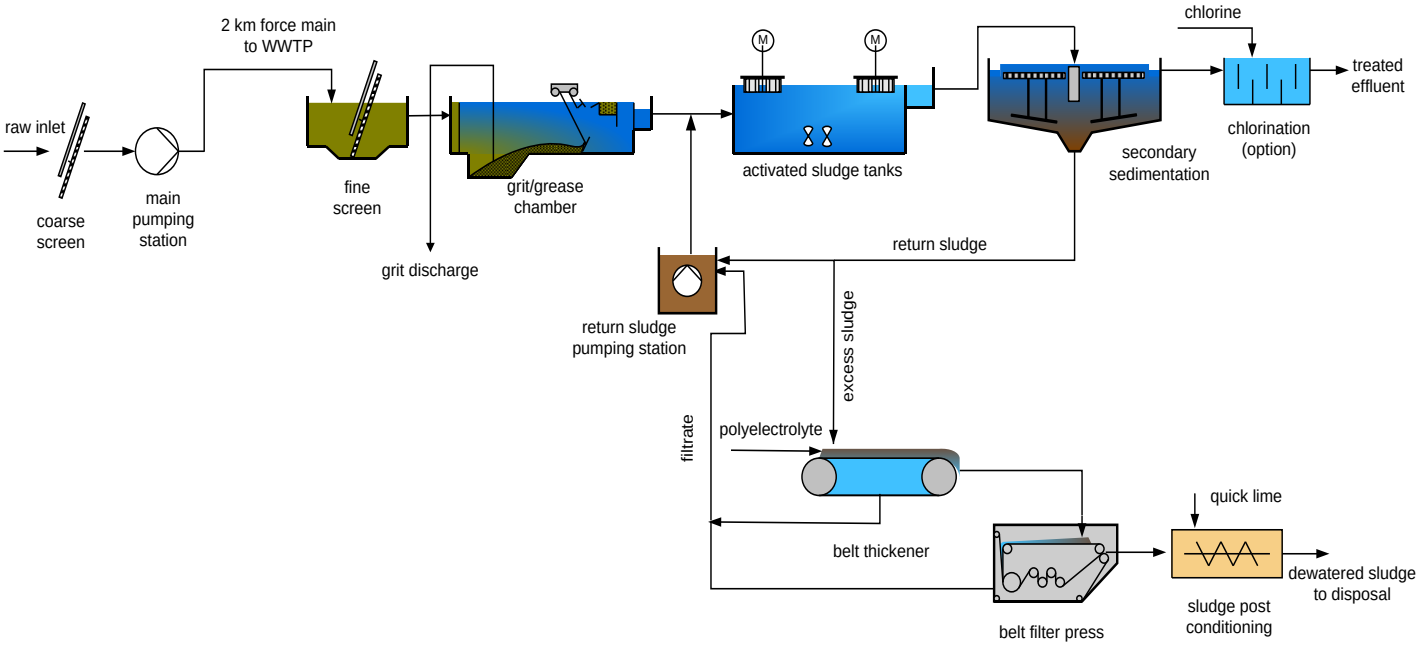

1. Objective

Treatment of municipal wastewater

Design loads at plant inlet for first phase

Max. daily dry weather flow	103,000 m3/d
BOD_5	36,500 kg/d
COD	61,452 kg/d
Suspended solids	43,000 kg/d
Nitrogen, total	6,096 kg/d
Phosphorus, total	2,924 kg/d

Treated water quality

BOD_5	20 mg/l
COD	60 mg/l
Suspended solids	30 mg/l

2. Plant Concept

Wastewater is pumped via the main pumping station (max. 7,900 m^3/h) located approx. 2 km outside to the treatment site and enters the WWTP by an inlet chamber with further gravitational flow through the plant up to the receiving water.
After the pre-treatment by screens and grit / grease chambers, the wastewater is treated biologically.
Biological treatment consists of aeration tanks with oxidation ditch design for degradation of organic carbon as well as Nitrogen removal by means of nitrification and simultaneous or intermittent denitrification. Activated sludge is separated in the downstream final settlement tanks and routed back from the return sludge pumping station to the distribution channel of the aeration tanks simultaneously used for pre-denitrification of return sludge.
Excess sludge withdrawn from the return sludge pumping station will be mechanically thickened and dewatered by belt thickeners/ belt filter presses.

Before thickening the excess sludge is conditioned by addition of coagulation aid for improvement of thickening and dewatering. The dewatered sludge can be post conditioned with quick lime. The dewatered sludge will be either discharged into containers or piled up on the sludge storage area before final disposal from the plant. Moreover provisions have been made for addition of a wastewater disinfection by chlorination.

3. Characteristic plant data

Main pumping station

Coarse screen	1 No
Bar spacing	60 mm
Main wastewater pumps	3+1 Nos
Capacity, each	2,633 m^3/h

Mechanical pre-treatment

Fine screens	4 Nos
Bar spacing	6 mm
Screenings wash presses	2 Nos
Grit chambers	8 Nos
Type: Logitudinal, aerated grit chamber	
Length	30 m
Width grit chambers	2.0 m
Width grease chambers	1.2 m
Grit / Grease scrapers	4 Nos
Type: Double bridge blade scraper	
Aeration blowers	4 + 2 Nos
Grit / Grease pumps	16 Nos
Grit classifiers	2 Nos

Biological treatment

Aeration tanks	8 Nos
Volume, each	5,300 m^3
Submersible mixers	16 Nos
Vertical shaft aerators	16 Nos
Capacity, each	282 kg O_2/h
Rated power, each	160 kW
Final settling tanks	4 Nos
Diameter	50 m
Water depth, at 2/3 radius	4.4 m
Blade Scrapers	4 Nos
Return sludge pumps	5 + 1 Nos
Capacity, each	1,360 m^3/h
Excess sludge pumps	3 + 1 Nos
Capacity, each	110 m^3/h

Sludge treatment

Belt Thickener / Belt Presses	3 Nos
Capacity, each	110 m^3/h, 840 kg DS/h
Coagulation aid dosing station	2 Nos
Sludge lime mixer	1 No
Silo plant for quick lime	1 No
Sludge storage area	3,000 m^2

Extension of the plant

The WWTP is under construction for the first phase and ahead of schedule for the second phase due to the strong population growth. The third phase comprises the extension to 1,200,000 PE.

Alexandria Construction Company

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