



WWTP, WTP and Marine Outfall



Marine Outfall – WWTP Ribeira dos Moinhos

Sines – Santiago do Cacém (Portugal)

Work description

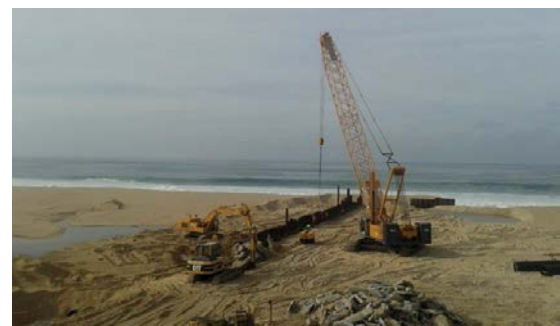
The public company Águas de Santo André has awarded to Seth the contract for repair the Outfall of the mill Ribeira WWTP that covering the municipalities of Sines and Santiago do Cacém.

Under this contract, Seth has completed the replacement of the initial section which discharge into the sea the treated wastewater, on a distance of 120 meters.

With a total length of 2480 meters, the outfall transports wastewater originating in the Sines Industrial and Logistics Zone and urban effluents from the municipalities of Sines and Santiago do Cacém, that after treatment at WWTP, are launched the sea through a series of nozzles situated at its end to a depth of 40 meters.

The conduct is in HDPE DN900, with a first buried section and an approximate length of 60 meters.

About 60 meters downstream of the valve chamber, has run an access to the outfall consists of a manhole cover with flange DN 900 stainless steel.



Work Summary

Client	Águas de Santo André (Grupo Águas de Portugal)
Contract Type	Lump Sum
Construction Period	2015 - 2016
Cost	€ 359 840,00





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Desalination Plant

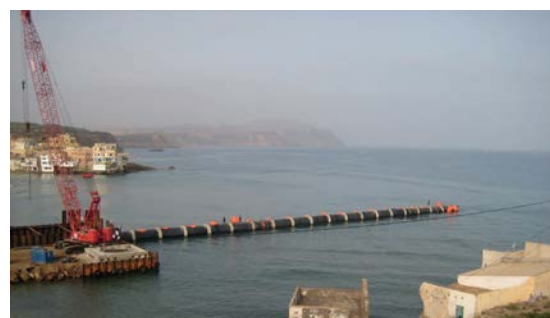
Beni Saf, Algeria

Works description

Driving of sheet piling cofferdam to perform release pipe 2.400mm and 1.800 mm, and implementation of outfall, including dredging, in 1,200 m long pipe of 2,400 mm and 800 m to 1800 mm pipe diameter. Running water intake tower and sinking the same.

Description of the work

- Crimping and unbolt of curtain sheet piles: ± 1041 ml
- Dredging sand: 33589,16 m²
- Underwater rock blasting and its dredging: 6316,05 m³
- Excavations: 87541,38 m³
- Release and sinking tubing $\varnothing 2400$ mm: 1200m
- Release and sinking tubing $\varnothing 1800$ mm: 800m
- Running rings for pipes: 286 units
- Implementation of knights to pipes: 86 units



Work Summary

Client	Befesa, Cobra, Codesa, Sadyt
Contract Type	Contract price
Construction Period	2007
Cost	€ 9 733 604,23





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Marine Outfall

Albufeira, Faro (Portugal)

Works description

The contract for the "Design and Construction of the Reinforcement of the Disinfection Stage of the Vale de Faro Wastewater Treatment Plant, in Albufeira, and the Corresponding Treated Effluent Disposal at Sea Infrastructures" was awarded to the consortium that included Seth, in 2004, and it was completed within 210 days.

Main features

- Construction of one marine outfall pipe (HDPE Ø 1000 mm) w/ 1020 m long;
- Construction of one earthy outfall pipe (HDPE Ø1000 mm) w/ 926 m long;
- Work done at depths between -11 and -13 m datum level;
- Unloading flow in WWTP: 4.232 m³ / h;
- Population: 130.000 inhabitants.

Architect/Engineer: WW-Consultores de Hidráulica



Work Summary

Client	Águas do Algarve
Contract Type	Lump Sum
Construction Period	2004 – 2005
Cost	€ 3 512 305,00





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Construction of the Interception System at Terreiro do Paço – Cais do Sodré

Lisbon (Portugal)

Work Description

Pumping station Agencies

Construction of a pumping station wastewater near the European Maritime Safety Agency (EMSA) and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) at about 370 meters from the Palace Square.

The pumping of Agencies Station was equipped with 4 electric pump groups with unit flow rate up to 550 l / s.

The deployment area covers an area of 290 m², with a depth of construction of 12 m below the natural ground. The project was implemented at a distance of 5 meters to Tagus River.

Building support / Post processing

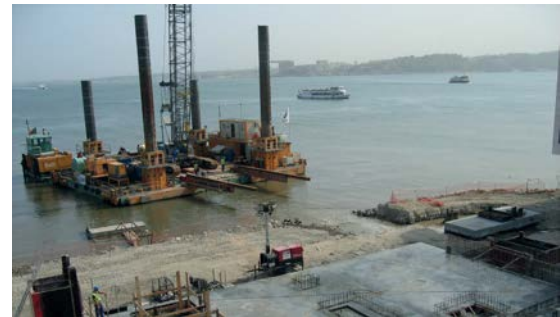
Construction of an annex for the installation of all electrical system command of the pumping station, namely: the transformer substation; emergency generator set; electric command and control.

Outfall

Construction of an outfall 150 m in length, installed in open trench in the Tagus riverbed, high-density polyethylene pipe with DN 1100 mm.

Section of the Interceptor

Building 60 m interceptor gravity Ductile iron pipe DN1200 mm. This portion implanted to 7.00 m depth, is located just upstream of the pumping station allowing its entry wastewater.



Work Summary

Client	Simtejo, SA
Contract Type	Contract price
Construction Period	2009 - 2010
Cost	€ 8 186 553,00





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Faro Northwest WWTP – Remodeling and Enlargement)

Loulé, Faro (Portugal)

Work Description

The new plant was designed for a treatment capacity of 44,530 Inhabitants equivalent and for new quality goals for the final effluent, particularly with regard to microbiological parameters.

The area served covers part of the parishes of Almancil and São Clemente, of the municipality of Loulé and part of the parishes of Santa Bárbara de Nexe, Conceição and São Pedro, and the whole of the parish of Montenegro in the municipality of Faro.

Presentation of the Infrastructure

The recommended treatment scheme involves two lines and, in hydraulic and procedural terms, it was dimensioned for a design horizon year of 2033. It is based on a system of biological treatment using activated sludge, involving long aeration in two biological reactors configured as two oxidation ditches with surface aerators.

The solution adopted comprises a three-stage treatment scheme:

1 – Liquid Stage

Intake system: equipped with rotating-drum screens to remove bigger solids / Grit/grease removal, to remove sand, oils and fats / Reception of sludge from septic tanks / Contact tanks and receivers (selectors) and biological reactors of the oxidation ditch type, where the biological treatment takes place / Secondary decanters to remove the biomass from the effluent, a part being recycled to the process / Microfiltration in rotating-drum microatomisers / Disinfection of the final effluent from the Plant by ultraviolet radiation / Additional disinfection of part of the effluent with a view to its use as service water within the area of the Wastewater Treatment Plant.

The receiving environment for the final effluent from the Faro Northwest Wastewater Treatment Plant is the Ramalhete Creek of the Formosa Ria.

2 – Solid Stage

Conditioning with polyelectrolyte / Thickening (in a thickening drum and mechanical dehydration (in centrifuge) of the excess biological sludgem / Elevation of the dehydrated sludge and its storage in silos.

3 – Odour Control

Extraction and treatment, at a chemical odour-control unity, of the foul air from the sludge entering and treatment stages. This treatment design is considered the most advantageous in both economic and operational terms, taking into account the size of the plant and the regulations governing the discharge of residual waters from the Plant fixed by the Algarve Hydrographic Region Administration (ARH): CBO5- 25 mg/l; COD-125 mg/l; TSS- 35 mg/l; and Fecal Coliforms < 300 MPN/ 100 mL.

Work Summary

Client	Águas do Algarve, SA
Contract Type	Design-build
Construction Period	2008 – 2010
Cost	€ 9 700 000,00





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WWTP at Lagoinha (Design-build)

Palmela (Setúbal) (Portugal)

Description of Work

The purpose of the Lagoinha wastewater treatment plant is to process the urban wasters of about 18,000 inhabitant-equivalents (i.e., about 60% of nominal capacity). It was dimensioned to respond to a population of 30,600 inhabitant-equivalents. The average flow to be treated in the project-horizon year is 7,650m³/day, with a peak flow of 670m³/hour. It comprises a treatment line that includes the following main stages:

Initial Pumping and Preliminary Treatment

The initial raw wastewater pumping station is designed for a water column height of 11.4m. Following reception of the raw wastewater it is mechanically pre-treated in 2 compact-equipment lines in which the fine sieving and sand-, oil- and fat-removal operations are combined in a single, completely-enclosed unit installed at the surface.

Secondary and tertiary treatment

The biological treatment involves prolonged aeration using Carrousel Biological Reactors. Comprising two symmetrical units, they have a capacity to handle 6,500m³ of effluent. They are 9.20m high and 6 metres are below ground level. The Secondary Decantation is undertaken in 2 identical circular tanks having a conical bottom slab equipped with bottom-scraper pontoons. Each tank is 22m in internal diameter, 3m high, 2 m being below ground level.

Effluent treatment

Part of the final effluent from the Treatment Plant is disinfected for the purpose of reuse as Service Water, both for washing and for irrigation of the green spaces.

Sludge treatment and storage

Mechanical dehydration of the digested sludge is undertaken in two centrifuges located in the operations building. The storage and treatment of the excess biological sludge is undertaken in two identical cylindrical reinforced-concrete tanks of a diameter of 10.5m and a height of 4.5m. The sludge thickening tank is equipped with a bottom scraper.

Deodorisation

Extraction and treatment of the foul air involves a BIOFILTER. The recommended Biofilter has an area of 80m² and a biomass filtering height of 1.5m.

Work Summary

Client	Simarsul, SA
Contract Type	Design-build
Construction Period	2006 - 2008
Cost	€ 3 634 000,00





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WWTP at Redondo and Montoito

Distrito de Évora (Portugal)

Work Description

The Redondo Wastewater Treatment Plant and its ancillary infrastructures are designed to treat the urban wastewater of about 7000 inhabitant-equivalents. The average daily flow to be treated over the project horizon is 1265 m³/day, with a peak flow of 145 m³/hour.

It consists of a treatment line that includes the following main stages:

Pre-treatment

(course screening, fine screening, sand and grit removal, measurement and pumping the sewage to a higher level);

Secondary and Tertiary Treatment

(biological treatment using the prolonged sludge aeration process, and assisted secondary decantation to remove soluble phosphorus);

Final Processing of the Effluent

(micro-screening of the clarified effluent and disinfection by ultraviolet radiation);

Sludge Treatment

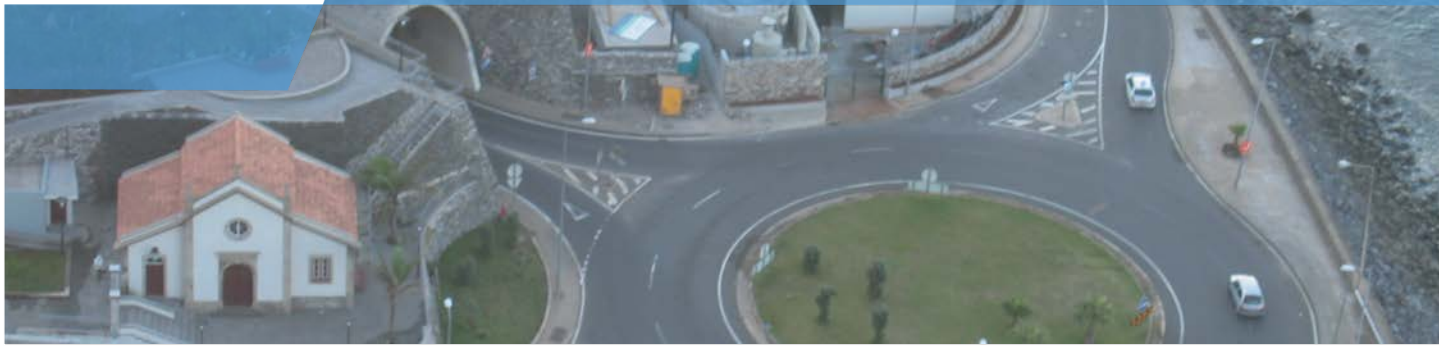
(gravity thickening of excess biological sludge and centrifuge dehydration).



Work Summary

Client	Águas do Centro Alentejano, SA
Contract Type	Turnkey
Construction Period	2005 - 2006
Cost	€ 5 255 480,00





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WWTP Ribeira Brava

Praia, Tabua (Ribeira Brava) Madeira Island (Portugal)

Scope of work

Turn-key construction of a wastewater treatment plant for the local government at Madeira Island, in Tabua (Ribeira Brava), to 13200 inhabitants served, with a treatment flow of 3164 m³ per day. Works included civil construction, procurement and installation of all specific, mechanical, electrical and control equipment and pre-engineered systems, as well as all commissioning tests.

Treatment Steps

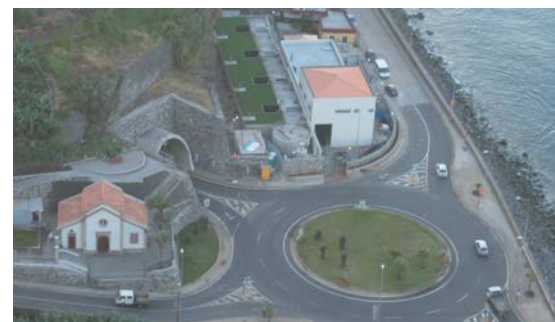
Pretreatment – Vertical screening; grit removal; raw effluent equalization; flow measurement.

Secondary treatment – Sequential biological reactors (SBR).

Tertiary treatment– Equalization of the decanted effluent; filtration in closed pressure filters; disinfection by ultraviolet (pressure); storage of the treated effluent.

Slug Treatment– Gravity thickening; centrifugal dehydration; stabilization with quicklime.

Odor treatment– To reduce odors in the area surrounding the wastewater treatment plant, odor treatment equipment using an activated carbon system was installed.



Work Summary

Client	SRARN (DRSB)
Contract Type	Turnkey
Construction Period	2004 - 2005
Cost	€ 6 8000,00



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Water Treatment Facility

EPAL, Vale da Pedra, Azambuja (Portugal)

Scope of work

Design-build construction of a water treatment facility for the EPAL in Vale da Pedra (Azambuja).

Works included all civil construction, procurement and installation of all specific, mechanical, electrical and control equipment and pre-engineered systems, as well as all commissioning tests. After construction the WTP has capacity to grant 400.000 m3 /day of treatment flow.

Architect & Engineer: Hidrocontrato



Work Summary

Client	EPAL
Contract Type	Design-Build
Construction Period	2002 - 2003
Cost	€ 3 185 715,00





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Water Treatment Facility

U.S. Navy - Lajes Field, Azores (Portugal)

Scope of work

Turn-key construction of a water treatment facility for the US Navy in Lajes Air Field (Terceira, Azores). Works included all civil construction, procurement and installation of all specific, mechanical, electrical and control equipment and pre-engineered systems, as well as all commissioning tests. After construction, under a separate contract, SETH has also been responsible for the operation of this facility.

Capacity: 750 000 gal/day

Architect & Engineer: Glenn & Sadler (USA)



Several views of the equipment installed in the facility.

Work Summary

Client	U.S. Navy
Contract Type	TurnKey
Construction Period	2001
Cost	USD 3,31 million





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Wastewater Treatment Plant

PORTUCEL SOPORCEL Group

(old INAPA Pulp and Paper Mill), Setúbal (Portugal)

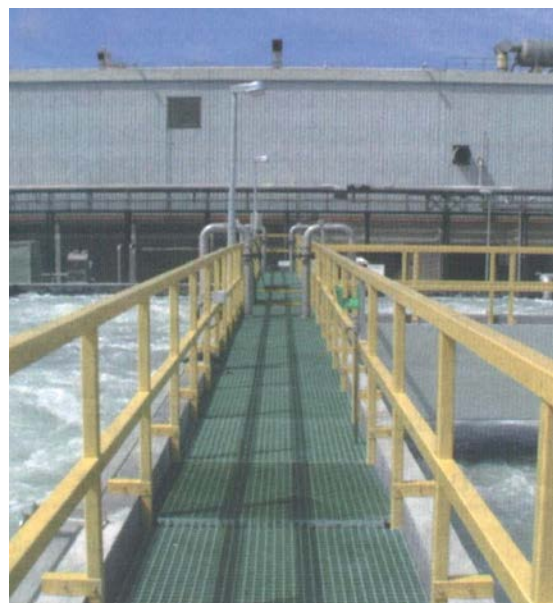
Main features

Construction of an Industrial WWTP for the INAPA Paper Mill Plant.

Main Quantities

- Population: 180 000 inhabitants
- Treatment flow: 800 m³/h
- Treatment level: Secondary
- Treatment system: Biological reaction
- 2 Biological reaction tanks (50x 25x8 m)
- 1 Equalizer tank (50x10x8 m)
- 1 Parshall flume (outlet flow)
- 1 Thickener tank with scraping bridge (Ø12 m, 5,5 m H)
- Excavation 39 000 m³
- Backfilling 6900 m³
- Concrete 3300 m³
- Formwork 16 400 m²
- Rebar and steel works 243 ton

Architect & Engineer: Hidrocontrato, SA



Work Summary

Client	Papéis INAPA, SA
Contract Type	Turn-Key
Construction Period	1999 - 2000
Cost	€ 3 831 243,32





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Wastewater Treatment Plant

SYSTEM II - Colares, Sintra (Portugal)

Main features

Construction of an WWTP for the Municipality of Sintra (Colares).

Main quantities

- Inhabitants served 35 000
- Treatment flow 7900 m³/h
- Treatment level Secondary
- Treatment system Activated sludge
- 2 Primary decanters
- 2 Aeration tanks
- 2 Secondary decanters
- 2 Digesters
- 1 Sludge drying plant
- 3 Pumping stations
- Excavation 45 000 m³
- Backfilling 33 400 m³
- Concrete 2200 m³
- Formwork 12 000 m²
- Rebar and steel works 125 ton



Work Summary

Client	Câmara Municipal Sintra
Contract Type	Turn-Key
Construction Period	1996 - 1997
Cost	€ 1 700 000,00





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Wastewater Treatment Plant

U.S. Navy - Lajes Field, Azores (Portugal)

Main features

Construction of a WWTP for the US Navy at Lajes Field, Azores (Portugal). Design was made by a US engineering firm. Construction was done on a turn-key basis and included all works: civil works, procurement and expediting of all electrical, mechanical and control equipment, as well as all commissioning and start up operational tests.

Also included in the contract was the construction and furnishing of the laboratory building. Scope also included the construction of a piping network about 6 km long, manholes and 3 pumping stations.

Architect & Engineer: Allen & Hoshall (USA)



General view of the WWTP. Background: the clarifier tanks



General view of the control and laboratory building

Work Summary

Client	U.S. Navy
Contract Type	Turn-Key
Construction Period	1995 – 1997
Cost	€ 4 800 000,00