

Seth



Company Profile





**Portuguese License
Construction No. 5**

Corporate Headquarters

**S.E.T.H.-Sociedade de Empreitadas e Trabalhos
Hidráulicos, SA**

 Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS
Portugal

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 seth.pt

 seth@seth.pt

Maintenance Facilities and Main Warehouse

 Rua da Ponte, n.º 2
2950-422 PALMELA
Portugal

- Main Warehouse
- Sandblasting and Paint Shop
- Carpentry Shop
- Mechanic and Welding Shop
- General Archives

SETH in brief

Founded 1933

S.E.T.H. – Sociedade de Empreitadas e Trabalhos Hidráulicos, S.A., was founded in 1933 by Danish company Højgaard & Schultz a/s (current MT Højgaard Holding), which decided to establish itself in Portugal after the construction of the Port of Setúbal.

Over its 93 years of history, Seth has successfully completed numerous building and infrastructure construction projects in Portugal and several African countries.

Seth has developed a wide range of projects and continues to operate in Portugal (including the Azores and Madeira), Angola, Algeria, Bermuda, Cape Verde, Gibraltar, Guinea, Guinea-Bissau, Iceland and Mozambique.

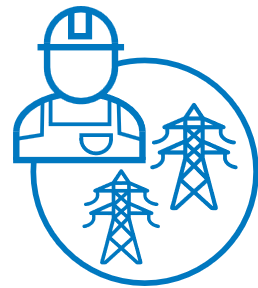
SETH's Specialties

Marine Works

- Ports
- Marinas
- Shore Protection Structures



Transmission and Distribution Lines



Civil Works

- Building and Industrial Construction
- Concrete and Special Formwork
- Design-Build
- WWTP, WTP
- Marine Outfall
- Gas, Oil and Fuel Pipelines
- Irrigation / River Engineering



Pile Foundation

- Pile
- Sheet Pile





CERTIFICATE



Management system as per
EN ISO 9001:2015, EN ISO 14001:2015

In accordance with TÜV AUSTRIA procedures, it is hereby certified that



SETH - Sociedade de Empreitadas e Trabalhos
Hidráulicos, S.A
Main Office
Avenida Tomás Ribeiro, Nº 145
2790-467 Queijas
Portugal

Palmela Central yard
Rua da Ponte 2
Orvidais
2950-422 Setúbal
Portugal

applies a management system in line with the above standard for the
following scope

Coordination and execution of public civil construction works, namely for building
works, coastal protection, ports, hydraulics, gas pipelines, concrete and metal
structures and pile driving.

Certificate Registration No. 20100243019445
20104243019446

Valid until: 2027-08-31

Initial certification: 2018-05-17

Certification Body
at TÜV AUSTRIA GMBH

Vienna, 2024-07-02

This certification was conducted in accordance with TÜV AUSTRIA auditing and certification
procedures and is subject to regular surveillance audits.
TÜV AUSTRIA GMBH Deutschstraße 10 A-1230 Wien www.tuv.at



Online Verification



www.tuv.at/onlinecheck

ZERTIFIKAT | CERTIFICATE | CERTIFICAT | CERTIFICADO | CERTIFICAT | 証明書 | 證書 | 証明書 | 證書



CERTIFICATE



Management system as per ISO 45001:2018

In accordance with TÜV AUSTRIA procedures, it is hereby certified that



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2950-422 Setúbal
Portugal

applies a management system in line with the above standard for the
following scope

**Coordination and execution of public civil construction works, namely for building
works, coastal protection, ports, hydraulics, gas pipelines, concrete and metal
structures and pile driving.**

Certificate Registration No. 20116243019447

Valid until: 2027-09-10
Initial certification: 2021-02-08

Certification Body
at TÜV AUSTRIA GMBH

Vienna, 2024-07-02

This certification was conducted in accordance with TÜV AUSTRIA auditing and certification
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TÜV AUSTRIA GMBH Deutschstraße 10 A-1230 Wien www.tuv.at



Online Verification



www.tuv.at/berufschek

Work Portfolio



Harbour and Coastal Engineering



Running path of a new 180-ton travel of a new 180-ton travel lift

Lagos, Algarve (Portugal)

Work description

The contract awarded to Seth aimed at the construction of a new infrastructure that will allow the lifting and transport of recreational/fishing vessels up to 30 m in length for repair and restoration in a shipyard, promoting the economic and tourist activity of the region.

The solution studied comprised the execution of 10 driven metal piles with a diameter of Ø1016mm x 16mm, made of S355J0 steel, and lengths between 24.10 and 28.76 ml. To enable the driving of the piles, it was necessary to temporarily remove the riprap protecting the existing slope, with its partial replacement planned after the driving of the metal piles, as well as the execution of a temporary embankment. Before driving each pile, a driving guide was installed, supported by auxiliary piles. Driving tests were carried out on three of the most distal piles by the company Geoproviders.

The piles were driven using a PTC 65HD vibratory hammer and a CX85 impact hammer, both powered by a CO650 hydraulic power plant. Permanent sheet pile walls were driven in three of the spans between tubular piles, with Larssen ZZ-36 and ZZ-20 sections, to contain the existing slope.

Two reinforced concrete C50/60 bearing beams, measuring 31.5x2.25x1.75 m3, were constructed and supported on driven piles, along with a tie beam measuring 16.5x1.15x1.75 m3, with a corbel, on which the transition slab will be supported, using a special Carldora-type formwork solution.

A C40/50 concrete transition slab measuring 16.5 x 8m2 was constructed, supported on the transition beam and over controlled slab stone.

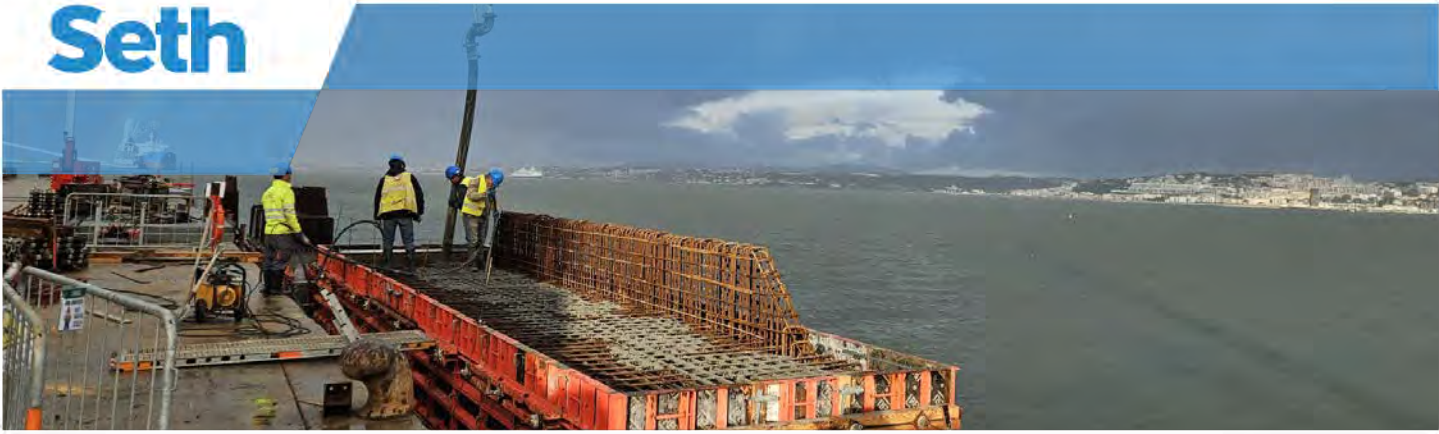
The marina bottom was dredged with buckets to a depth of -3.0m ZH throughout the surrounding area.

For pedestrian access, a 32ml FRP walkway solution was installed on both bearing beams by the company STEP. Foundation piles were also driven for a floating pontoon, and a metal support structure was built, founded on driven HEB 500 profiles, with a spacing of 18 ml.



Work Summary

Client	Sopromar, Lda
Contract Type	Lump Sum
Construction Period	2025 - 2026
Cost	€ 1 008 147,40



Harbour and Coastal Engineering



Restoration of docking conditions at the Portinho da Costa pier

NATO POL Ammunition Depot Station, Lisbon (Portugal)

Work description

The project to restore berthing conditions at the POL NATO Ammunition Quay in Portinho da Costa aimed to restore 4 berthing posts (new flexible Duques d'Alba berths with quay stops), rehabilitate the lower part of the existing quay platform where some anomalies were visible, and redesign the mooring devices supporting the quay.

In addition to the concreting of the section between elevations +4.55 ZH and +5.95 ZH at berth no. 2, the installation of the "Yokohama" pneumatic floating fender, measuring 2500 mm x 5500 mm, was carried out at Berthing Post No. 1.



Work Summary

Client	Sopromar, Lda
Contract Type	Lump Sum
Construction Period	2025 - 2026
Cost	€ 1 008 147,40



Harbour and Coastal Engineering

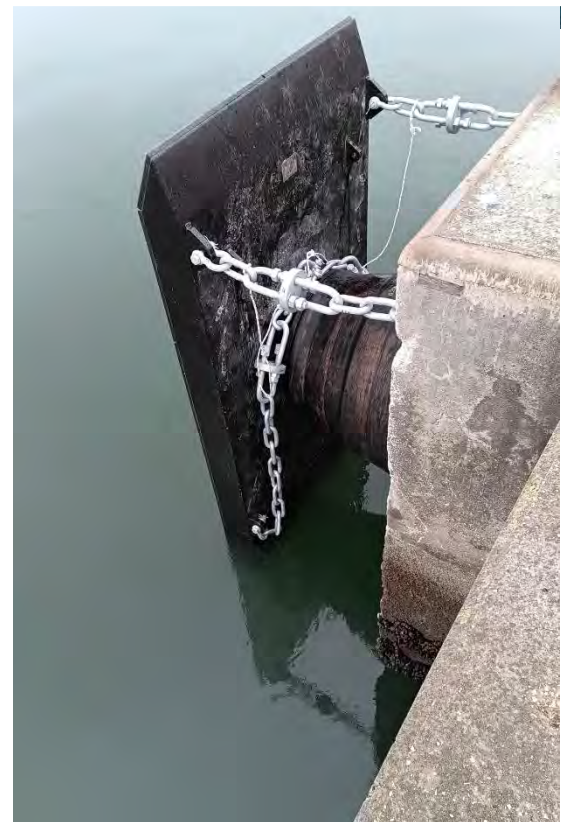


Reinforcement of Fenders and Mooring Boreholes

Port of Aveiro – Aveiro (Portugal)

Work description

Seth has completed the first phase of the project with the installation of 21 mooring bollards of 80 tons each and 44 ship berthing fenders at the North Container and Ro-Ro Terminal. 126 bollard fixings, 416 fender fixings, and 32 structural reinforcements of the quay's front panels (shields) were carried out. Next, Seth has completed the installation of 12 mooring bollards of 80 tons each and 35 mooring bollards of 50 tons each at the North General Cargo Terminal.



Work Summary

Client	Administração do Porto de Aveiro, SA
Contract Type	Lump Sum
Construction Period	2025 em Progresso
Cost	€ 2 251 802,60





Harbour and Coastal Engineering



Works of dredging in the basin of CREVRON Port

Malongo, Cabinda (Angola)

Work Description

The contract, executed in Consortium, consisted of dredging 170,000.00 m³ in the berthing area of docks 1 and 2 of Porto da Chevron in Malongo, Cabinda (Angola).

The defined dredging quota was -6.5m (LAT). Dredging was carried out using a Cutter Suction Dredger (CSD 450), which discharged the material into a temporary retention basin, whose function was to decant the dredged mixture, ensuring the retention of the sand, to be transported and unloaded at a specific location.

In order to ensure the speed of material removal tasks, one of the work fronts was dedicated to extracting sand using earthmoving machinery. At a more advanced stage, a new front appeared, consisting of a DOP Pump and a crawler crane, to fill in the area to be dredged next to the dock walls.

The works awarded also included the placement of all the dredged material on land, using a "dry" area of approximately 8,000.00 m² located 3 km from the pier for this purpose.

Main work volumes

Dredging: 170.000,00 m³

Equipment used

Cutter Suction Dredger (CSD 450)

Work Summary

Client	Ministério das Finanças e do Fomento Empresarial
Contract Type	Lump Sum
Construction Period	2025 em Progresso
Cost	€ 8 998 930,60





Harbour and Coastal Engineering



Rehabilitation of the wall, removal, supply and driving of piles

Trafaria River Station – Trafaria Parish, Almada (Portugal)

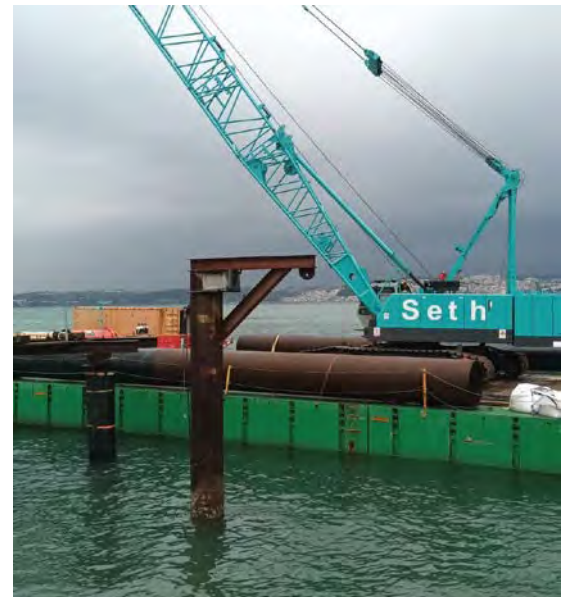
Work description

Seth has completed the requalification of the Trafaria River Station, specifically the design/construction contract for the rehabilitation of the wall, removal, supply and driving of piles at the aforementioned river station.

This project was awarded by TTSL – Transtejo Soflusa, in which SETH's intervention had two distinct aspects, namely:

- **Installation of 4 new piles** (1220 mm diameter) **for guiding the Rio Coia pontoon** (removal of seven existing damaged piles, and installation of 4 new piles, 1220 mm diameter x 22 mm, with a length of 22 ml);
- **Execution of the rehabilitation of the wall structure**, with the execution of a riprap prism adherent to the current wall, consisting of a TOT core protected by a riprap layer totaling 9900 tons.

The current infrastructure represents a real improvement in public service conditions on the Trafaria – Porto Brandão – Belém river link, allowing it to resume its original route and vehicle transport service.



Work Summary

Client	TTSL – Transtejo Soflusa, SA
Contract Type	Lump Sum
Construction Period	2024
Cost	€ 1 298 372,06



Harbour and Coastal Engineering



Reconversion of Pier 4, Cryogenic Liquefied Gas Terminal

Sines Multipurpose Terminal – Sines, Setúbal (Portugal)

Work description

APS – Administração dos Portos de Sines e do Algarve, S.A., awarded to Seth the contract for the conversion of Pier 4 of the Sines Multipurpose Terminal (Pier 4 TMS), in order to create the necessary conditions to operate cryogenic liquefied gases.

The main interventions to be carried out include

- Relocation of the docking station by 150 m to the SW;
- Construction of 3 new Dolphins Mooring for docking and mooring ships;
- Construction of 4 Berthing Dolphins on land, for mooring ship cables;
- Construction of a 40x20 meter platform (Dolphins Mooring) for the installation of loading arms and/or hoses for tankers and for the installation of hoses for the movement of cryogenic products, including a bridge to support the pipeline mat connecting to this platform.

With this project, the pier's intervention area will increase from 1.83 ha to 2.09 ha and the bottom level will remain the same (-15 ZH).



Work Summary

Client	APS, SA (Administração do Porto de Sines e do Algarve)
Contract Type	Lump Sum
Construction Period	2023 – 2024
Cost	€ 11 831 295,34



Harbour and Coastal Engineering



Reinforcement of Fences and Mooring Bollard

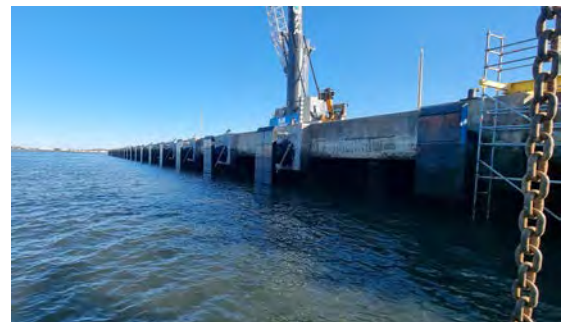
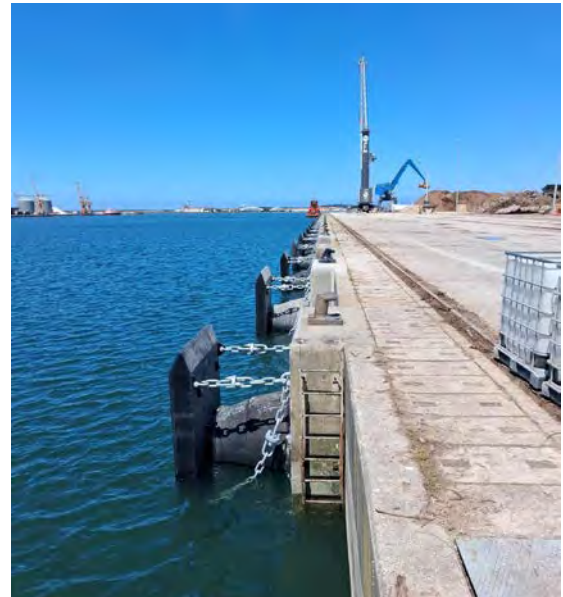
Sines Multipurpose Terminal – Sines, Setúbal (Portugal)

Work description

Seth has completed the first phase of the project with the installation of:

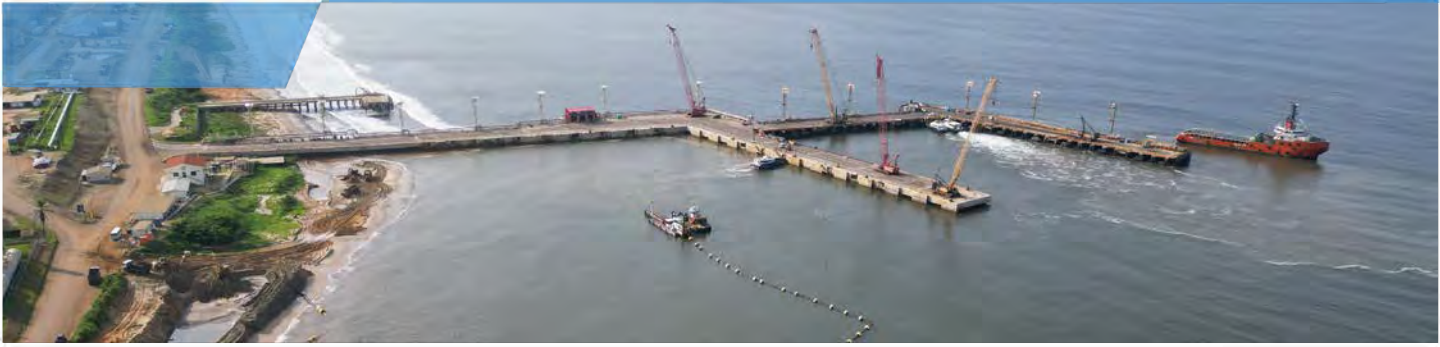
- 21 mooring bollards of 80 tons each
- 44 ship berthing fenders at the North Container and Ro-Ro Terminal.
- 126 bollard fixings, 416 fender fixings and 32 structural reinforcements of the quay's front panels (shields) were carried out.

Next, Seth has completed the installation of 12 mooring bollards of 80 tons each and 35 mooring bollards of 50 tons each at the North General Cargo Terminal.



Work Summary

Client	Administração do Porto de Aveiro
Contract Type	Lump Sum
Construction Period	2025 - 2026
Cost	€ 2 251 802,60



Harbour and Coastal Engineering



Works of dredging in the basin of CREVRON Port

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Work Description

The contract, executed in Consortium, consisted of dredging 170,000.00 m³ in the berthing area of docks 1 and 2 of Porto da Chevron in Malongo, Cabinda.

The defined dredging quota was -6.5m (LAT). Dredging was carried out using a Cutter Suction Dredger (CSD 450), which discharged the material into a temporary retention basin, whose function was to decant the dredged mixture, ensuring the retention of the sand, to be transported and unloaded at a specific location.

In order to ensure the speed of material removal tasks, one of the work fronts was dedicated to extracting sand using earthmoving machinery. At a more advanced stage, a new front appeared, consisting of a DOP Pump and a crawler crane, to fill in the area to be dredged next to the dock walls. The works awarded also included the placement of all the dredged material on land, using a "dry" area of approximately 8,000.00 m² located 3 km from the pier for this purpose.

Main work volumes

Dredging: 170.000,00 m³

Equipment used

Cutter Suction Dredger (CSD 450)



Work Summary

Client	Cabinda Gulf Oil Company Limited
Contract Type	Lump Sum
Construction Period	2022 - 2023
Cost	€ 4 604 440,28





Harbour and Coastal Engineering



Extension and improvement of Commercial Quay at Ponta Delgada Island of S. Miguel, Azores (Portugal)

Work description

Reprofilation of the Quay-10 (ZH), Repaving the Port Embankment and Improvement of the Technical Networks integrated therein and Dredging of the harbour basin of Ponta Delgada, Island of São Miguel, Azores.

Maritime Work

- Advancement of the pier to the north, parallel to the existing, caisson structural solution;
- Dredging for setting up the pier and obtaining service levels, -10.00 and -12.00ZH;
- General dredging of the maneuvering area of the port basin;
- Execution of Ro-Ro ramp.

Infrastructures

- Elevation of the pier front from the current elevation between +2.80 and +3.00ZH to +3.50ZH elevation;
- Total repaving and painting of the road access road and stowage park;
- Full replacement of the potable water supply network for ships and repair of water tanks;
- Total replacement of the fire network powered by a portable high-flow pump;
- Complete replacement of all electrical networks, including supply of a new Transformer Station and supply and installation of new lighting columns for the quay and embankment;
- Full replacement of all communication networks;
- Execution of new gutters adapted to the new quay and embankment dimensions with renovation of all existing networks.

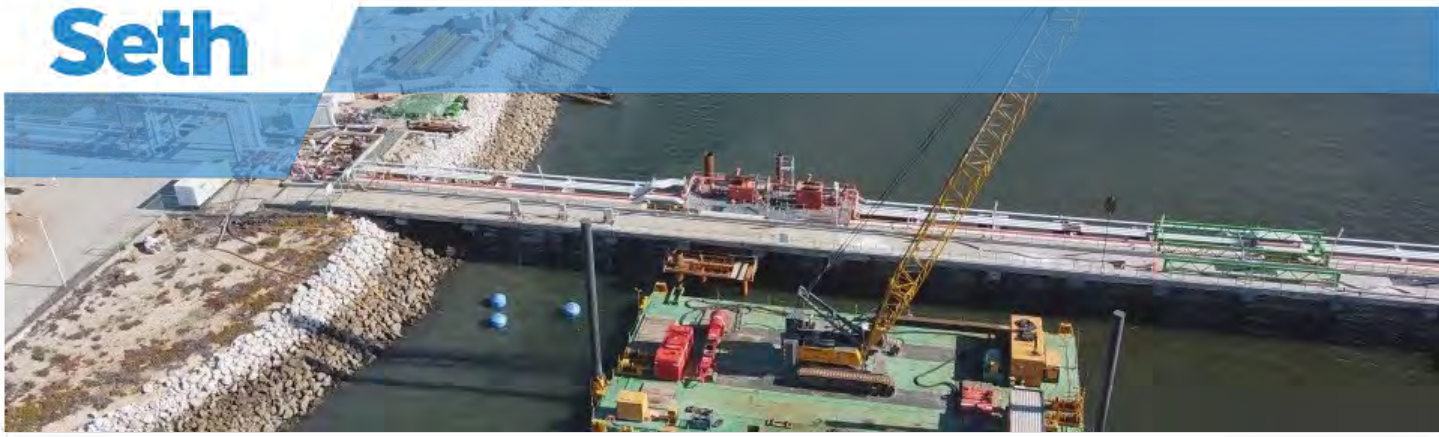
Buildings

- Construction of the New Port Operations and Exploration Building;
- Construction of the New Weighing Control including the supply of 2 weighbridges;
- Construction of the New Entrance;
- Construction of the New PT Building.

Work Summary

Client	Portos dos Açores, SA
Contract Type	Lump Sum
Construction Period	2020 - 2023
Cost	€ 42 650 000,00 (Valor Final Acumulado: Autos + Revisão de Preços)





Harbour and Coastal Engineering



Rehabilitation and Improvement of Quay at Tanquisado

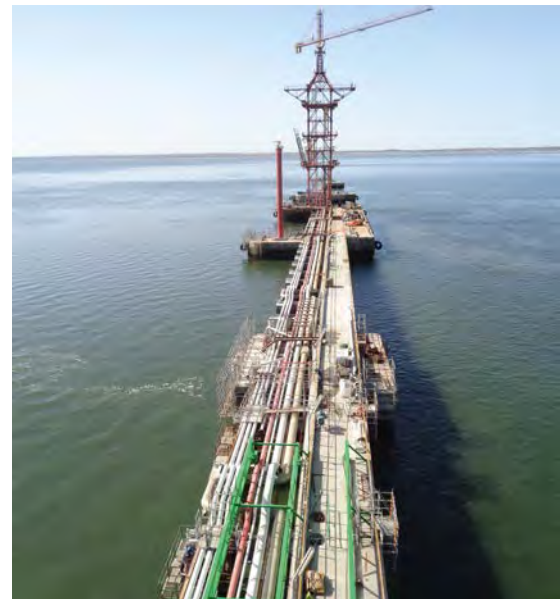
Mitrena – Setúbal (Portugal)

Work description

Seth took on the execution of the contract for the Rehabilitation and Reinforcement of the jetty at the Tanquisado/Eco-Oil Maritime Terminal, located in the Sado riverbed, at Mitrena, Setúbal (Portugal) with a deadline of 300 days.

This terminal is under concession to Tanquisado - Terminais Marítimos, SA and Eco Oil - Tratamento de Águas Contaminadas, SA, and is intended for handling bulk liquids (fuels), and has a ship cleaning and degassing station. It is equipped with:

- A quay and berthing dolphins;
- A west berth (Tanquisado) for tankers carrying fuel, allowing the berthing of ships up to 200 meters long and with a draught of up to 9.5 meters.
- An east berth (Eco-Oil) for ships destined for the ship cleaning and degassing station, allows the berthing of VLCC ships with drafts up to 7.5 meters.



Work Summary

Client	Tanquisado – Terminais Marítimos, SA
Contract Type	Lump Sum
Construction Period	2021 - 2023
Cost	€ 4 551 432,55





Harbour and Coastal Engineering



Extension and improvement of English Quay

Island of Maio, Cape Verde

Description of Works

The contract under the responsibility of the Ministry of Infrastructure, Territorial Planning and Housing of the Republic of Cape Verde, was financed by the African Development Bank in 82.13% and by the Republic of Cape Verde in 17.87 %.

The works lasted 35 months (12 months suspended pandemic period) and included the execution of the following works:

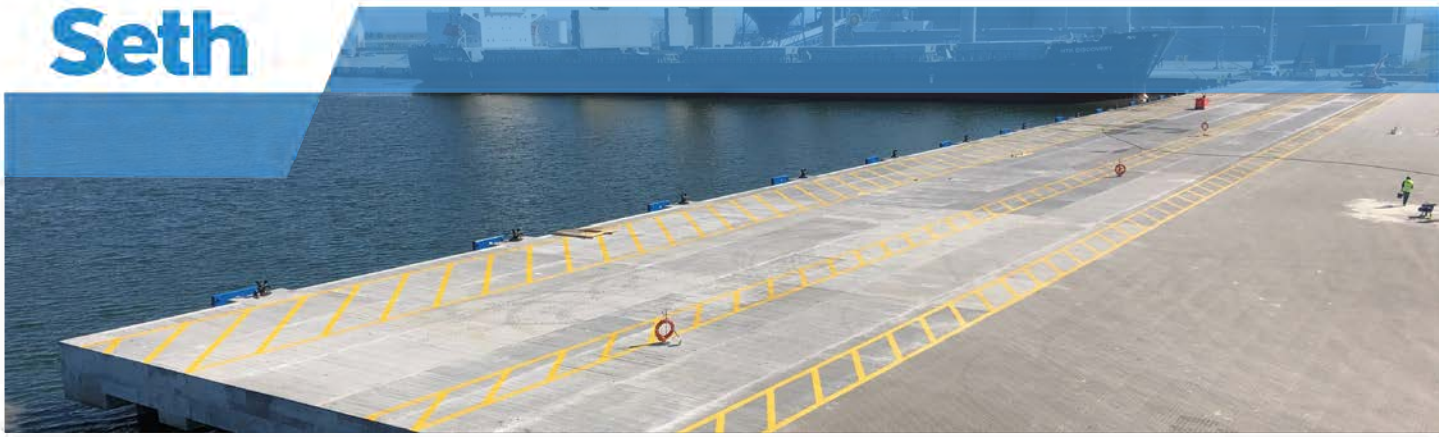
- 1– Rehabilitation and repair of the existing quay which is 340m long and 14m wide:
 - a) General repair of the structure (existing pile caps, transversal and longitudinal beams and slabs);
 - b) Replacement of mooring fittings (fenders and mooring bollards);
- 2– Construction of a "Roll-on/Roll-off" quay 120m long and 40m wide, founded on 112 reinforced concrete piles Ø970 mm and equipped with two ramps;
- 3– Construction of a detached breakwater 145m long, with depths located between -7.00 and -12.00 ZH. The breakwater heads were reinforced with 656 concrete blocks of "Accropode TM II" type, with an average weight of 16 tons;
- 4– Rehabilitation and extension of the port embankment, doubling its initial area of 7000 m²;
- 5– Reconstruction and reinforcement of the Logistic Platform's embankment protection, consisting of a rockfill prism 260m long;
- 6– Upgrading of the 900m access road leading to the port.



Work Summary

Client	Ministério das Infra-Estruturas, do Ordenamento do Território e da Habitação da República de Cabo Verde
Contract Type	Lump Sum
Construction Period	2019 - 2022
Cost	€ 20 805 758,63 (valor final acumulado Autos + revisão de preços)





Harbour and Coastal Engineering



Jetty Berth at Port of Aveiro

Port of Aveiro, Gafanha da Nazaré, Ílhavo (Portugal)

Works Description

The Administration of the Port of Aveiro (APA) awarded to Seth the contract for the construction of a new berth for ships for around seven million euros in Gafanha da Nazaré, Ílhavo (Portugal).

This berth was designed to support the productivity of companies that install production units in the Port of Aveiro, and was assumed to be strategic to allow the appropriate transport operation for the dimensions and weight of the elements in question, reducing logistical costs that would be associated with the transfer between the manufacturing site and the shipping point.



The works of this contract, with a duration of 340 days, consisted of the execution of a berth within the Port of Aveiro, to be used by a company producing large-scale structures for the construction of offshore wind towers. Due to the high loads, the executed pier was the first to consider overloads of this dimension and to be dimensioned for this purpose.

In terms of quantities of materials and works, the aforementioned contract comprised:

- Execution of 120 driven metal piles of Ø1016 mm and 18 mm thick for the foundations of the deck.
- 200 ml x 25 ml reinforced concrete tray, including all dock accessories, namely, 14 fenders and 14 bollards. The water network was also installed on the pier.
- Construction of pavement with base and sub-base, for the execution of a concrete pavement slab and pave layer with a thickness of 10 cm.
- Within the scope of the contract, 2 dolphins mooring were also built in metal piles and two concrete blocks for bollards.

Work Summary

Client	Administração do Porto de Aveiro
Contract Type	Lump Sum
Construction Period	2020 - 2021
Cost	€ 6 848 532,32





Harbour and Coastal Engineering



Jetty Berth and Dolphins

CLC Port, Republic of Guinea-Bissau

Description of Works

EPC Contract for construction of two mooring dolphins, 2 berthing dolphins and a new platform (for manifolds) on existing jetty at Bandin Oil Terminal, in Guinea Bissau. This project also includes the demolition of the existing structures (to be replaced) and the installation of temporary berthing and mooring structures to allow the use of the Terminal during the construction phase.

The new (permanent) structures are composed by:

- Dolphins mooring– 4 driven steel piles of 1220mm // 21.6mm, connected by a rigid prefabricated metal frame in which a double quick release hook (QRH) of 60 ton will be installed;
- Berthing dolphins- 9 driven steel piles of 1220mm // 21.6mm, connected by a rigid prefabricated metal frame in which a double quick release hook (QRH) of 60 ton and a fender system (composed by two conical fenders and a steel panel 10m high by 3m wide) will be installed;
- New platform: 4 driven steel piles 1220mm // 21.6mm, connected by a prefabricated steel structure in which the prefabricated slabs will be installed.

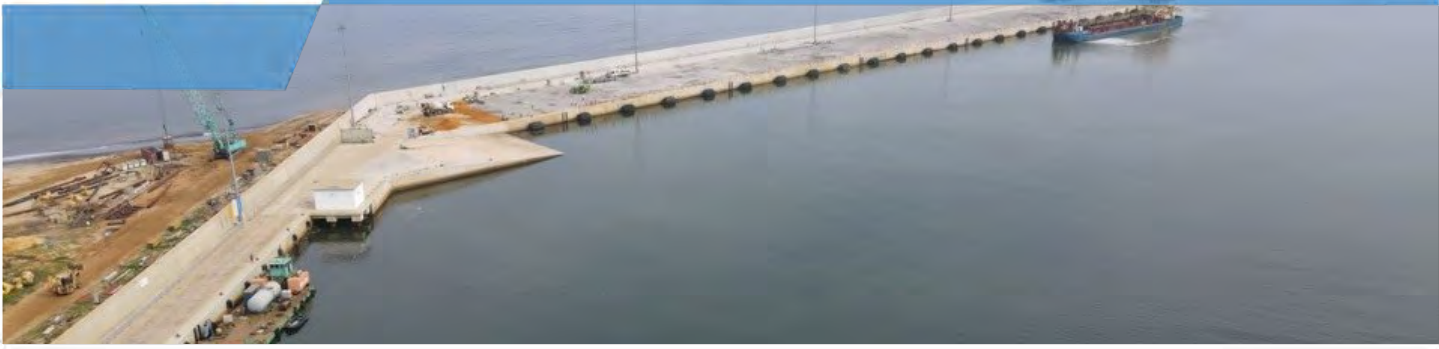
At the end of September 2019, the installation of the temporary berthing and mooring structures (ETA of the first vessel on 6 October) and the piling works on the upstream mooring dolphin were complete. The piling works performed during September were subjected to the performance of dynamic load tests to determine the load capacity of the piles.



Work Summary

Client	CLC GALP, Guiné-Bissau
Contract Type	Lump Sum
Construction Period	2019 - 2020
Cost	€ 7 546 886,26





Harbour and Coastal Engineering



New Breakwater and Quay of Cabinda Port

Cabinda, Republic of Angola

Description of works

In 2017, Seth started the consortium work on the subcontract for the construction of the new dockable breakwater at the Port of Cabinda in Angola. This work is part of a port and passenger port infrastructures project, awarded by the Maritime and Port Institute of Angola to the company China Gezhouba Group Company, Ltd.

The contract includes the construction of a breakwater of approximately 660m in length (divided between an access road with 295m long and 12.5m wide) and a liable area of 365m long by 39.8m wide and one ramp RO-RO.

As infrastructures to support the quay, a concierge building, a saltwater catchment and pumping building, a water reservoir, and a VTS tower were built.

The structural solution used involves the creation of a vibro compacted landfill, using sands from dredging, contained by two combined wall curtains (HZ800 + AZ18-800 planks) with variable lengths between 8m and 24.5m, each other.

The superstructure consists of crown beams and deflector wall in reinforced concrete.

Due to the length of the profiles / piles and to the geotechnical profile of the terrain, the water-jetting technique was successfully used and used to aid the drilling with the vibrating hammer.

Given the specificity of the site and the work to be done, Seth used its own machinery (sea and land) to carry out all the drilling, namely:

- Vibratory hammer ICE 55NF and ICE 815;
- Impact hammer IHC S-90 and PVE 9NL;
- Crane Liebherr LR1160 and Kobelco CKE1100;
- Self-elevating platform;
- Self-propelled modular barge.
- DOP 2320 pump



Work Summary

Client	Porto de Cabinda
Contract Type	Lump Sum
Construction Period	2018 - 2022
Cost	€ 42 700 000,00





Harbour and Coastal Engineering



Subsea Cable Installation to connect a Waveroller

Peniche (Portugal)

Description of Works

The scope had included the subsea cable installation works that interconnects an underwater power generation unit to a system control cabin located about 150 m from the shoreline, to convert the sea waves energy to electricity.

This system is called "Waveroller" and was installed next to Praia da Almagreira, Ferrel parish, Peniche municipality, at an average depth of 15 m and approximately 850 m from the coast.

Main quantities

- Cable reel weight: 13 tons
- Subsea Cable Installed: 1000 meters
- Earthmoving: 1600 m³
- Number of buoys used: 130 units
- Number of rollers used: 34 units

This work did not include the connection and installation work of the generator and its shovel (these works were performed directly by the Owner).



Work Summary

Client	AW - Energy OY
Contract Type	Lump Sum
Construction Period	2019
Cost	€ 54 918,89



Harbour and Coastal Engineering



Bauxite Export Jetty

Port Taresa (Kamsar), Republic of Guinea

Work Description

Compagnie de Bauxite et d'Alumine de Dian-Dian, SA (COBAD, SA) has awarded to Seth the construction works of the 116 meters-long Bauxite Export Jetty for barges with capacity up to 6,000 DWT at Port Taresa (Kamsar) at Republic of Guinea.

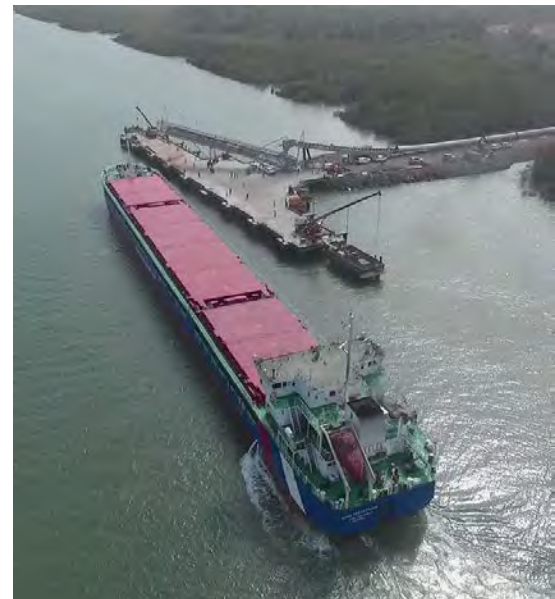
The Contract Price is in the amount of 6 million euros (all materials provided by COBAD) and had a scheduled duration of 10 months.

The Scope of Seth's works under this contract include:

Execution of Jetty foundations:

- The 73no. concrete socketed piles (Ø980mm//33mm with 22.00 meters);
- The 53no. driven piles (Ø970mm//29.5mm with 17.50meters);
- 53 piles (Ø970mm//29.5mm with 17.50 meters) driven into the ground;
- Installation of the steel beams and welding of those beams to the piles;
- Installation of prefabricated concrete slabs.

The completion of the concrete slab, the installation of the fender system, bollards, cathodic protection system or the other works associated with the extension of the causeway are not included in Seth's scope of (those works being carried out directly by COBAD).



Work Summary

Client	COBAD, SA (Compagnie de Bauxite et d'Alumine de Dian-Dian)
Contract Type	Lump Sum
Construction Period	2017 - 2018
Cost	€ 6 999 789,10



Harbour and Coastal Engineering



Kamsar Container Terminal, Phase III

Port of Kamsar, Republic of Guinea

Work Description

Three years after having completed the second phase of the Kamsar Container Terminal, Seth has returned to the Republic of Guinea (Conakry) to start a new contract.

This job began in July 2015 and involved the third phase of enlargement of the Container Quay that Global Alumina Corporation, SA, awarded to Seth for a sum of 12,401,909.85 euros.

The contract (for 12 months) was comprised by various maritime and port construction works, including the extension and enlargement of the existing quay with a berthing length of 170.00 m and a breadth of 17.50 m, duly equipped. Was applied a reinforced concrete solution in situ (beams and compression slab) involving the use of prefabricated concrete slabs acting as shuttering. This superstructure was supported on 103 tubular piles (914 mm diameter each) driven into the natural ground, with an average length of 51 m, the upper part (7.2 m) concreted.

Taking into account the specifics of the site, all the work was carried out directly by the company, namely:

1. Concrete production;
2. Prefabrication of the elements (some pre-stressed);
3. Preparation of the pile tubes;
4. Driving the tubular piles;
5. Casting the piles and support beams in situ;
6. Placement of pre-slabs;
7. Concreting of the deck (compression layer) and installation of all accessories.



Work Summary

Client	GAC Guinea Alumina Corporation
Contract Type	Lump Sum
Construction Period	2015 - 2016
Cost	€ 12 401 909,85





Harbour and Coastal Engineering



Fishing Harbour

Montijo (Portugal)

Work description

Seth has concluded a professional fishing quay owned by Cooperative Society Union in Montijo.

The project included:

- A berthing space 12 to 13 vessels simultaneously (with a maximum tonnage of 8.35 Ton);
- A beaching ramp for access of vessels and its maintenance / repair;
- A scaled pier platform to allow the placement of boats in a dry local;
- An area for the individual support facilities for storing fishing gear.

At the same time, SCUPA aimed for the environmental and landscape requalification of the area, the rehabilitation of the space around the old Salt Pan and Fish Nursery, and the preservation of the ruins of the old tidal mill existing on the site.

This project was inaugurated on January 23, 2016.



Work Summary

Client	SCUPA – Sociedade Cooperativa União Piscatória Aldegalense, CRL
Contract Type	Lump Sum
Construction Period	2015 - 2016
Cost	€ 548 523,00





Harbour and Coastal Engineering



Widening of the embankment and construction of a new access road in the Northeast area of the large port of São Vicente

Mindelo, S. Vicente Island, Cape Verde

Work Description

This project undertaken by Seth (in consortium) in Mindelo, São Vicente Island (Cape Verde), provides the city with two major, significant improvements: increase of the area of the port and alterations to its road accesses, and a significant increase of the dry area of the Laginha beach.



The better to understand the benefit of this job, it should be explained that the climate in São Vicente allows the beach to be used year round.

The enlargement of the open-air storage yard covers an area of about 24,000m², built entirely on an area that was previously sea. This enlargement was made possible by the construction of a prism embankment 580m in length using rip-rap. Having been built to a height of 1.80m above the average sea level, the embankment was externally lined with stones weighing between 500 and 1,500 kg and lined on the inside with geotextile with a mass of 300g/m².

The area contained by the embankment was reclaimed by sand pumped in by a trailing hopper suction dredger trough a 600 mm pipeline.

About 90,000m³ were dredged and pumped ashore until the correct level was reached, allowing crusher-run aggregate/ C 8/10 concrete to be laid.

As far as Laginha is concerned, it was a beach about 300m long by 20m wide on average at the start of the job, its entire width sloping down to the sea.

Upon completion of the work the beach is now as follows: a level area 400m long by 70m wide, which then slopes gently till reaching sea level.

This beach is now bounded to the south by the embankment and to the north by a stone groine 130 m long.

The increase of the beach to its final dimensions involved the use of 170,000m³ of sand that was dredged and pumped ashore.

Work Summary

Client	MITT de Cabo Verde
Contract Type	Lump Sum
Construction Period	2013 - 2014
Cost	€ 14 309 000,00



Harbour and Coastal Engineering



North Mole Extension

Gibraltar (British Overseas Territory)

Work Description

The contract of the "North Mole Extension" is the extension of Quay/Breakwater located in the northwestern part of Gibraltar (a small peninsula on the southern Iberian coast near the entrance of the Mediterranean Sea).

The extension of the existing Quay, 270 m, consists in the installation of 9 concrete caissons based on rockfill foundation and aims to increase the area of land available with the propose of building a new "Power Station" in this area.

This structure will be finished at elevation +4.00 m OD and the foundation to -8.00 m OD. From level -10.50 m OD to level -8.00 m OD runs a foundation formed by selected rockfill.

The 9 reinforced concrete caissons, approximately 2.300 ton/caisson, will be prefabricated inside the Port of Gibraltar using a slipform system.

The construction of each caisson starts on the Floating Dock "Ignatios" and ends with the caisson in floatation.

After conclusion, caissons will be towed to the North Mole where they will be sunk on the rockfill foundation previously executed using floating equipment, namely a dredger with backhoe and a pontoon.

The works will end with the execution of a top slab of in-situ.



Main quantities

- Caissons: 9 units;
- Concrete: 9,000 m³;
- Steel rebars: 850 tons;
- Sliding formwork area: 34,650 m²;
- Dredging: 20,250 m³;
- Rockfill: 15,000 m³.

Major equipment involved

- Floating Dock "Ignatios" 4.000 ton of capacity;
- Sliding formwork system;
- Tower crane 6 tons capacity, 50 m distance;
- Dredge w / backhoe;
- 2 Tugs;
- 1 Floating Pontoon (50 m x 15 m) w/ 1 crawler crane 100 ton;
- 1 Rough Terrain Crane, 70 ton capacity.

Work Summary

Client	Government of Gibraltar (através da Casais, SA)
Contract Type	Lump Sum
Construction Period	2014 - 2015
Cost	€ 11 750 000,00



Harbour and Coastal Engineering



Improvement and Rehabilitation of the Quay of ENACOL

Mindelo, Cape Verde

Work description

As part of a consortium, Seth has concluded the work of expansion and improvement of a pier to ENACOL (Oil Company of Cape Verde) in Mindelo, Sao Vicente Island.

The contract have included the following jobs:

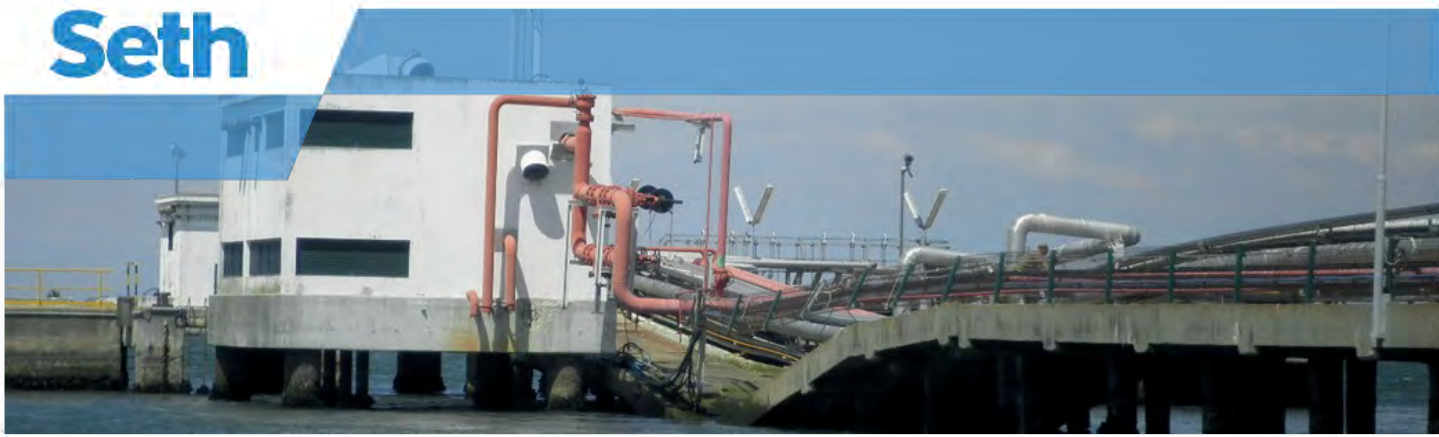
- Construction of an embankment for movement of vehicles and mobile equipment, built on existing wet area with about 1600m²;
- Enlargement of the existing quay to 10/12 m wide, with a total increase of this area with 1100 m².
- Construction of a quay with 40m length, replacing the existing one.
- Improvement of the existing pier jetty on the opposite face to the expansion.
- Construction of a fuel lines covered duct.
- Pavement of the new areas with a reinforced concrete slab.



Work Summary

Client	ENACOL, SA
Contract Type	Lump Sum
Construction Period	2014
Cost	€ 1 600 000,00





Harbour and Coastal Engineering



Rehabilitation of Pier 22 in the Liquid Bulk Terminal at the Port of Aveiro

Porto de Aveiro (Portugal)

Description of work

A 40 m long section of the quay collapsed as a result of erosion of the sandy bottom causing a loss of bearing capacity of the existing piling. The work performed was the replacement of the collapsed section.



Work performed

- Demolition and removal of superstructure and piles in the affected zone in reinforced concrete;
- Installation of reinforced concrete piles in steel pipe casings;
- Installation of prefabricated reinforced-concrete pile caps and beams;
- Installation of prefabricated slabs;
- Concreting top slab curbs.

In addition to the above referenced activities the sandy bottom was protected against further erosion with rockfill 80 to 100 Kg and the installation of two new fenders on the pier.

Main Quantities

- Piling: 12 piles (diameter 600 x 8mm w/ 20 ml long, driven 10 ml into the bottom of the estuary)
- Reinforcement: 34.288 Kg
- Prefabricated concrete: 64m3
- In situ concrete on deck slab and pile caps: 57m3
- Precast beams: 20 units
- Precast slabs: 22 units
- Armor stone: 800 ton
- Fenders: 2 units

Work Summary

Client	SGPAMAG
Contract Type	Lump Sum
Construction Period	2013 - 2014
Cost	€ 426 000,00





Harbour and Coastal Engineering

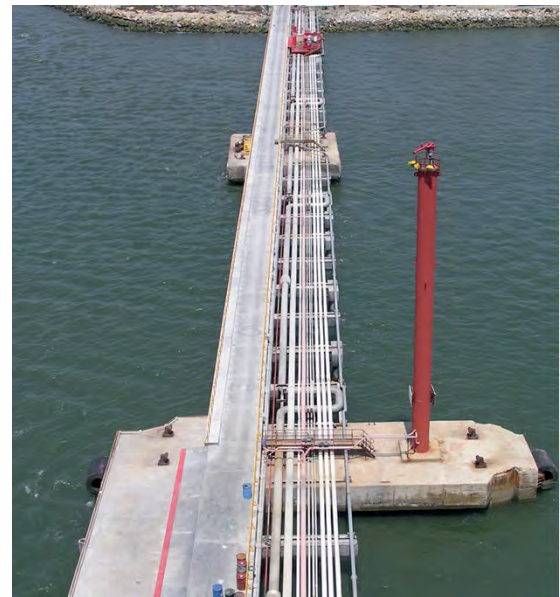


Rehabilitation of the existing Jetty

Mitrena, Setúbal (Portugal)

Description of the Works

The purpose of the contract was the rehabilitation of the existing jetty and the reinforcement of the "Mitrena Park" jetty with the construction of 34 new piles in the access tray.



Work Summary

Client	Tanquisado - Terminais Marítimos, SA
Contract Type	Lump Sum
Construction Period	2003 - 2004
Cost	€ 1 161 175,00





Harbour and Coastal Engineering



Works of dredging in the basin of PAENAL shipyards

Porto Amboim, Angola

Work Description

The scope of work included:

- Dredging of one basin with a Rhode Nielsen suction dredger (650,000.00 m3).
- Removal of sundry equipment buried in the seabed (as pipelines (1.300 m long) concrete blocks, anchors, steel cables).

This work was made with a rented vessel type Multical aided pump dredging "DOP" and divers team.



Most significant figures

- 650.000,00 m3 of dredging

Special Means

- Suction dredge Rhode Nielsen
- Pump dredging type DOP
- Vessel type Multical

Work Summary

Client	PAENAL Porto Amboim Estaleiros Navais, Lda
Contract Type	Lump Sum
Construction Period	2013
Cost	USD 9 228 265,19





Harbour and Coastal Engineering



Fender System – Doca dos Pescadores

Setúbal (Portugal)

Work Description

Quay #1

Supply and assembly, including the mobilization of all necessary equipment and means, of 12 cylindrical rubber fenders with 400 mm outside diameter and 200 mm internal diameter, with lengths of 3500 mm.

Quay #2

Supply and assembly, including the mobilization of all necessary equipment and means, of 38 cylindrical rubber fenders with 400 mm outside diameter and 200 mm internal diameter, with lengths of 3500 mm.

Equipment used

1 wheel crane (Liebherr LTM 1100) (hailed to site work by boat).



Work Summary

Client	APSS – Administração dos Portos de Setúbal e Sesimbra, SA
Contract Type	Lump Sum
Construction Period	2017 - 2018
Cost	€ 187 500,00





Harbour and Coastal Engineering



Rebuilding of Fender System Nova Cimangola Export Jetty

Luanda, Angola

Work Description

- Installation of 36 piles with 813 mm of diameter
- Concrete piles at bottom of sea level.
- Installation of 4 concrete foundations and fender system.

Work volume

- 1300 m3 of concrete
- 8 elastic fenders (Fentek SCN 1400).

Equipment used

1 wheel crane (Liebherr LTM 1100) (hailed to site work by boat).

Designer: Eng. Luís Colen



Work Summary

Client	NovaCimangola
Contract Type	Lump Sum
Construction Period	2003 - 2004
Cost	USD 2 200 000,00





Harbour and Coastal Engineering



Cassinga Project – Ore Terminal

Moçâmedes, Angola

Work carried out

Construction of a 600 m long berthing pier (pre-stressed concrete deck) for ships until 300 000 tdw.

Foundations: driven steel piles (*length: 43 m*).



Work Summary

Client	Companhia Mineira do Lobito
Contract Type	Lump Sum
Construction Period	1968 - 1972
Cost	N/D





Harbour and Coastal Engineering



Construction of River Side Steps

MAAT – Belém, Lisbon (Portugal)

Description of Works

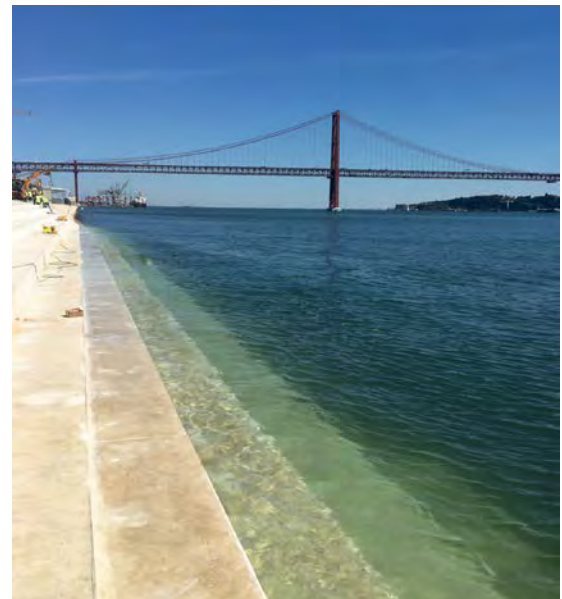
The aim of the project was the implementation of a new marginal structure on the riverside front of the new Museum of Art, Architecture and Technology (MAAT) of the EDP Foundation.

Main quantities

- 88 prefabricated elements installed in about 150 ml with the heaviest elements being 19 ton;
- 1600 m3 of excavation and dredging;
- Placement of 360 m3 of concrete in inclined slope;
- Demolition of 200 tons of reinforced concrete;
- Removal of 1300 m2 of equipped stone.

Means used

- 110 ton Track Crane (Kobelco CKE 1100)
- 24 ton Rotary Excavator w/ arm 17 m long (Case CX 240)
- Dredging bucket
- Maritime buoy of works



Work Summary

Client	Alves Ribeiro, SA
Contract Type	Lump sum
Construction Period	2016
Cost	€ 485 000,00



Harbour and Coastal Engineering



Riverbank Extension and New Ribeira das Naus Avenue

Cais do Sodré – Terreiro do Paço, Lisbon (Portugal)

Work description

Seth carried out the first stage of the job involving the refurbishment of the Avenida Ribeira das Naus area in Lisbon, thus contributing to the recovery of the history of this place, while also allowing a more contemporary use through the creation of gardens, a reflecting pool and a ramp providing access to the river, in addition to the opening to the public of a part of the Navy's central facilities.

This contract for the redevelopment of the public space and infrastructure involving the Widening of the Bank and the new Ribeira das Naus Avenue included the extension the river bank, an adjustment of the traffic lanes, an access ramp to the river, the pontoon near the Agencies Building and recuperation of the docks and pontoons that had long been buried.

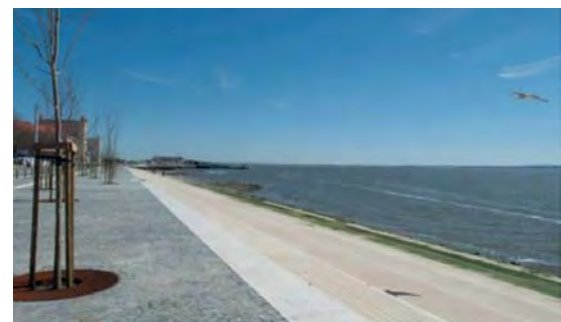
In this first stage the investment amounted to around 4 million euros, a percentage of which was provided by the Community Support Framework and the rest by the local authority itself.

Main quantities

- Piles – 78 units (length 22 m / diameter 1.20 m)
- Rebar cages – 700.000 Kg
- Concrete – 7.000 m³
- Dredging/Excavations– 20.000 m³
- Prefabricated slabs (on the Agencies pontoon) – 45 uni (rebar cages 22,000 kg / concrete 180 m³)
- Dolerite basalt paving cubes – 8.000 m²
- Tree planting– 48 units

Work Summary

Client	Câmara Municipal de Lisboa
Contract Type	Price Series
Construction Period	Fev 2012 – Mar 2013
Cost	€ 3 750 000,00





Harbour and Coastal Engineering



Clinker and Cement Export Terminal

Luanda, Angola

Work carried out

Construction of a 1000 m long access pier (reinforced concrete deck) and berthing pier founded over 30 m long piles.

Berthing/loading pier (120 m), 4 cement and clinker silos (5000 ton), cement bagging facility, conveyor belts and miscellaneous steel structures.

Inspection agency: Dar Al-Handasa Consultants (Beirute)



Work Summary

Client	CIMANGOLA U.E.M.
Contract Type	Design-Build
Construction Period	1982 - 1984
Cost	N/D





Harbour and Coastal Engineering



Kamsar Container Terminal and Barge Unloading Facility

Port of Kamsar Republic of Guinea

Works description

Seth has completed the design/construction of the Container Terminal at the port of Kamsar in the Republic of Guinea. The contract awarded for the sum of 18 million euro with a duration of 18 months. The construction of the quay is part of the project for the construction of an alumina refinery at Sangarédi, located in the interior of this West African country, the employer being the multinational enterprise Guinea Alumina Corporation. The Republic of Guinea has one of the worlds biggest reserves of bauxite (the raw material for the manufacture of aluminium), and the refinery will have a production capacity of 3.3 million tonnes per annum (Mtpa) manufactured from 9.4 Mtpa of bauxite extracted from the site.

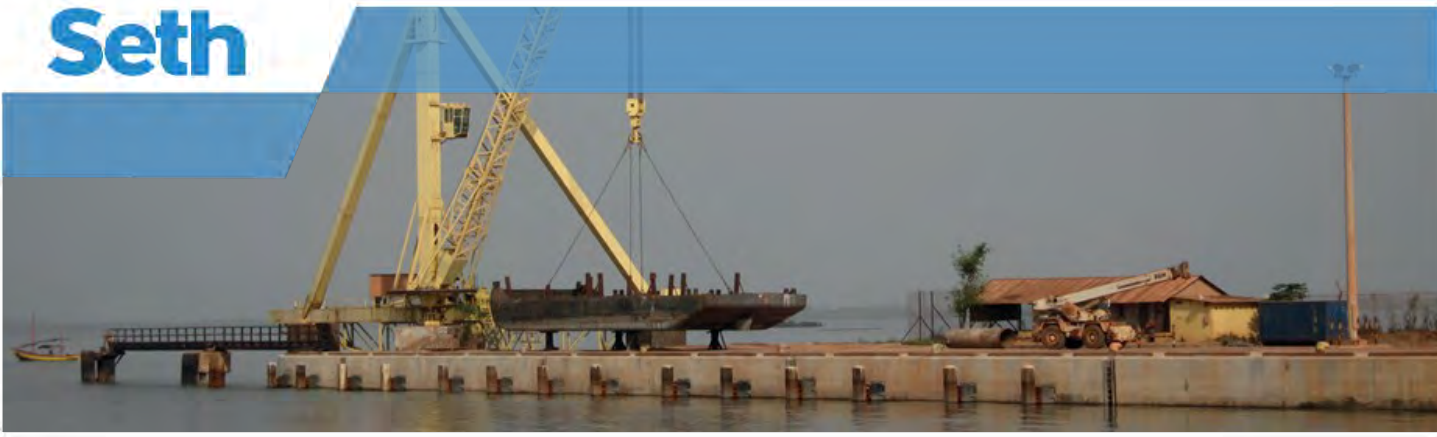
The quay comprises a berthing facility for cargo vessels and barges bringing the building materials required for the construction of the alumina export terminal infrastructures at Kamsar and for the refinery at Sangarédi. It is a precast reinforced concrete structure supported on circular steel piles of a diameter of 914 mm.

The quay is 230m metres long and can berth ships of up to 10,000 tons dwt. Its construction is essential to the project as there is no other quay in the region able to receive equipment of the dimension and weight of the equipment to be installed at the refinery.



Work Summary

Client	GAC Guinea Alumina Corporation
Contract Type	Lump Sum
Construction Period	2011 - 2012
Cost	€ 18 000 000,00



Harbour and Coastal Engineering



Rehabilitation of the French Quay

Port of Kamsar, Republic of Guinea

Description of Works

Seth, has concluded a job awarded by Compagnie des Bauxites de Guinée.

The job was located at the mining town of Kamsar, about 300 km north of the capital, Conakry.

The work was designed to rehabilitate the existing French Quay, a port structure dating from the 1950s, which was in bad condition.

During the rehabilitation work, the quay was operation at all times and continued to receive the two ships scheduled each month. These are the ships that supply Kamsar with the materials required for the mining operation and for the subsistence of the population.

The job consisted of driving a main curtain of sheet piling, driving an anchoring curtain of sheet-piling, and horizontal drilling under the existing quay to introduce the anchorage tie-rods linking both curtains.

Subsequently, a reinforced-concrete crown beam and pavement slabs were built. The work was concluded with the installation of a new fender system and erection of sundry quay furniture.

Designer: Haskoning UK, LTD



Main features

- Rehabilitation of a quay in operation;
- Driving two sheet-pile curtains, main and anchorage;
- Horizontal driving of steel pipes for subsequent installation of tie-rods;
- Installation of anchorage tie-rods;
- Excavation and landfill;
- Construction of the reinforced-concrete crown beam;
- Construction of reinforced-concrete pavement slabs;
- Installation of a new fender system;
- Installation of new quay furniture.

Work Summary

Client	CBG Compagnie des Bauxites de Guinée
Contract Type	Lump Sum
Construction Period	2006 - 2007
Cost	USD 3 000 000,00





Harbour and Coastal Engineering



Reinforcement of Intermediate Section of the Pier of the Port of Oran

Oran, Algeria

Description of works

Reinforcement of the intermediate section of the pier of the Port of Oran, in an extension of 1287m, with foundation stones placed in sub layers and toe footing, and cubic blocks like Antifer on the protection layer.

Main features and quantities

- Foundation stones TOT 254.074ton
- Foundation stones from 1 to 3 ton – 173 092 ton
- Foundation stones 3 to 6 ton – 216 355 ton
- Concrete in Antifer blocks of 40 ton – 91 928 m3
- Concrete in pier wall – 2 844 m3
- Steel in pier wall – 22 000 Kg



Work Summary

Client	Direction des Travaux Publics de la Wilaya d'Oran
Contract Type	Lump Sum
Construction Period	2007 - 2010
Cost	€ 35 176 600,00





Harbour and Coastal Engineering



Reconstruction of a Pier at Naval Base of Mers-El-Kébir

Mers-El-Kébir, Algeria

Description of works

Repair of the track, with the construction of the foundation beams and the provision and application of rails, a distance of 520 ml.

Rehabilitation of the South Jetty, with the construction of the capping beam on existing blocks quay with a length of 375 m.

Rehabilitation of the North Pier, the execution of 21 entries lost metal mold 813 mm in diameter, in front of the pier.

The implementation of the new infrastructure with dock included 54 concrete blocks and concrete superstructure in situ.

Main Features and Quantities

- Excavated: 1.000 m³
- Concrete: 3.590 m³
- Steel: 325 t
- Supply and installation of rail: 874 ml
- Terminals: 43 un
- Fenders: 43 un
- Rockfill: 2.000 t.



Work Summary

Client	Ministère de la Défense National de la République Algérienne Démocratique et Populaire
Contract Type	Lump Sum
Construction Period	2009
Cost	€ 6 405 061,00





Harbour and Coastal Engineering



Platform landfill and protective embankments at Koudiet Eddraouch

Annaba, Algerie

Description of works

This contract in Annaba (Algerian East coast) near the border with Tunisia, was the implementation of a platform next to the sea, for the installation of the pumping station water sea to the combined cycle.

The work itself consists of an execution platform approximately 400 m x 200 m, protected by dikes artificial concrete blocks 8 tons each.

Also included are the establishment of five tubes each 4 meters in diameter, in the root zone emissaries slopes.

Main features and quantities

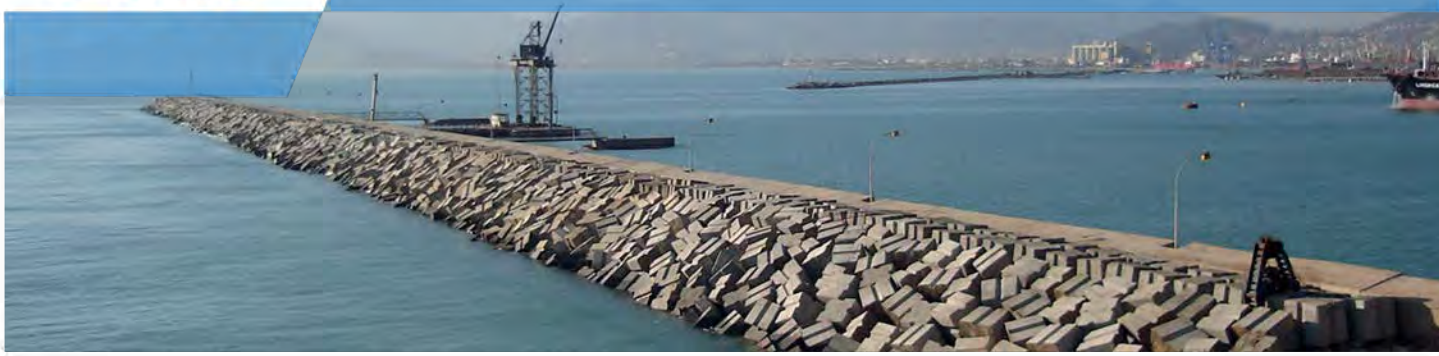
- Dredging: 8.850 m³
- Selected core rockfill: 13.775 m³
- Geotextile fabric: 8.024 m²
- Filter rockfill 3-5 kg: 1.881 m³
- Filter rockfill 500-700 kg: 11.252 m³
- Cloak rockfill 5-7 ton: 20.742 m³



Work Summary

Client	Iberdrola
Contract Type	Lump Sum
Construction Period	2009
Cost	€ 6 500 000,00





Harbour and Coastal Engineering



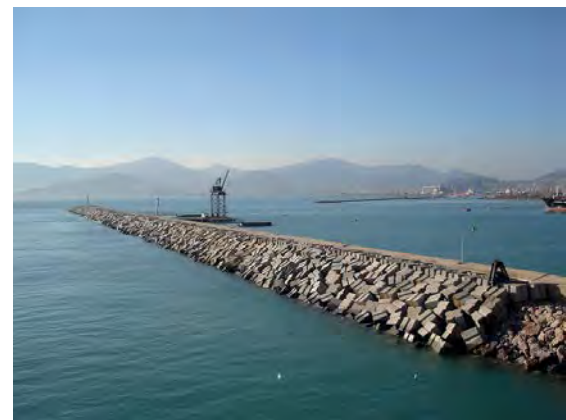
Rehabilitation of East Breakwater of the Oil Port of Béjaia

Béjaia, Algeria

Description of works

Rehabilitation of east breakwater of the oil port of Béjaia with sub-mantles of selected rockfill and protective mantles of cube type Antifer of 13 and 24 tons.

Construction of a pier on piles board at elevation -12.00 m of berth length of 78m and two 20m side walls. For connecting the pier to the existing jetty was built in TOT with about 35m wide with asphalt concrete pavement.



Main features and quantities

- Selected rock fillings: 59.387 m³
- Concrete blocks: 20.434 m³

Work Summary

Client	Ministère des Travaux Publics de l'République Algérienne
Contract Type	Lump Sum
Construction Period	2006 - 2008
Cost	€ 7 320 000,00



Harbour and Coastal Engineering



Construction of a Quay in the Oil Port of Béjaia

Béjaia, Algeria

Description of works

Construction of a quay on sheet piles, with a quota of service (-12.00 m) ZH and forward berth of 78 m in length. The pier is topped by two lateral containment structures of 20 m in length and attached to the existing breakwater embankment by approximately 35 m wide, in TVC with wear layer of bituminous concrete. The basin is dredging at elevation -12.00 m.

Main features and quantities

- Dredging: 450.000 m³
- Sheet-piles AZ 50: 950 t
- Concrete: 1.490 m³ / Aço: 170 t
- Bituminous concrete: 480 t
- Rockfill 50-200 kg: 350 t
- Rockfill 200-1000 kg: 600 t
- Broken stone 0/40: 1.700 ton
- TVC 0-200 kg: 65.000 ton
- Bollards type 100 ton: 12 units / Fenders: 4 units



Work Summary

Client	SOGEPORIS Entreprise Portuaire de Béjaia, EPE
Contract Type	Lump Sum
Construction Period	2008 - 2009
Cost	€ 11 146 000,00





Harbour and Coastal Engineering



Circular cofferdam embankment and outlet for water of a Combined Cycle

Terga, Algeria

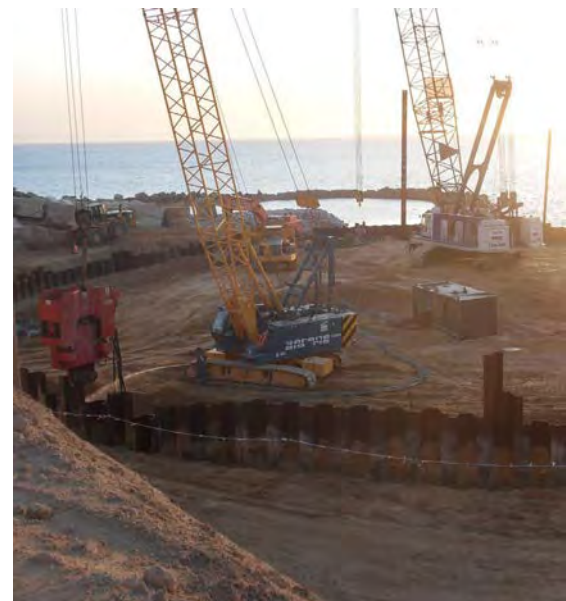
Description of works

Execution of landfill and a circular cofferdam shape with a diameter of 70 m, consisting of AZ50 with cuttings board 25 m long, reinforced with beams ring of reinforced concrete containment as temporary work for the construction of an outlet of water.

Work defensive front stick with core rockfill TVC 50-500 kg and riprap protection with selected ranges of 0.5-1 ton, 0.5 to 2 ton, 3.1 ton and 5.3 ton.

Main features and quantities

- Excavation and dredging: 44.680 m³
- Rockfill: 54.760 m³
- Sheet piles AZ50: 1.430 ton



Work Summary

Client	ORASCOM
Contract Type	Lump Sum
Construction Period	2009 - 2010
Cost	€ 14 450 000,00



Harbour and Coastal Engineering



GNL – 3Z Project – Service Quays Construction

Arzew Port, Algeria

Work description

Construction work on the docks of service-3Z LNG project in Arzew, Algeria. This work involved the construction of two quays consisting of staves columns of reinforced concrete, headed by a capping beam, also in reinforced concrete.

These two new docks, with funds services at elevation -9.50 m (ZH), have 85 l 35 m long, respectively, and will be used for dredging vessels, tugboats and other vessels to support the development of work-LNG project 3Z at the Port of Arzew.



Main features and quantities

- Staves – 160 un
- Reinforced concrete staves – 1.200 m3 Reinforced concrete superstructure – 450 m3 Dredging - aprox. 9 628 m3
- Armourstone– 5.000 m3



Work Summary

Client	Snamprogetti Chyoda s.a.s. di SAIPEM S.p.A.
Contract Type	Lump Sum
Construction Period	2009
Cost	€ 2 600 000,00



Harbour and Coastal Engineering



Oeiras Pleasure Harbour

Oeiras (Portugal)

Work description

Oeiras Pleasure Harbour located about 15 Km's west of Lisbon, is one of the most modern pleasure harbours of the "Sunny coast of Portugal" between Estoril coast and Sintra.

Scope included dredging, a breakwater and berths for 275 boats of various sizes, refurbishing of the surrounding area, including the installation of urban equipment (lighting fixtures, benches and planters) and shops, restaurant, police station, and parking to 250 automobiles.

Main work volumes

- Concrete: 4 000 m³
- Steel Structure: 165 000 Kg
- Foundation piling Ø300mm: 48 units
- Steel piles Ø580 mm: 49 units
- Steel gangways w/ wood: 1400 m²
- Concrete pav. vessel parking area: 4269 m²
- Bituminous concrete pavement: 2142 m²



Work Summary

Client	Câmara Municipal de Oeiras
Contract Type	Design-build
Construction Period	2004 - 2005
Cost	€ 7 000 000,00



Harbour and Coastal Engineering



Leixões Multipurpose Terminal Port of Leixões (Portugal)

Work description

The contract for the Construction of the New Multipurpose Terminal at the port of Leixões was awarded by the APDL (Douro and Leixões Ports Authority) to the consortium of which Seth is a member, with a duration of 22 months and included the following jobs:

- Dredging two basins, one with a service depth of -8.50m (CD) and another of -5.00 m (CD);
- Construction of an Advance Structure of the South Mole Quay;
- Construction of a Fixed Roll-On/Roll-Off Platform;
- Construction of the New Block Wall Quays to depths of -8.50 m (CD) and -5.00 m (CD);
- Construction of two Rock-fill Bank Retaining Walls;
- Construction of a Slipway and an Open-air Storage Area at a level of +6.00 m (CD).

Restructuring the area in various areas:

- Repair of the vertical parameter of the present quay-wall of the South Mole;
- Removal of sundry equipment;
- Restructuring the technical networks;
- Restructuring the stormwater run-off networks;
- Repaving the port's existing open-air storage area.



Main quantities

- Dredging of soft materials to design level - 106.000 m3
- Dredging of rock - 99.000 m3
- Rock blasting - 73.000 m3
- Earthmoving - 100.000 m3
- Ungraded rock-fill - 95.500 m3
- Graded rock-fill - 16.700 m3
- Concrete - 40.000 m3
- Paving - 37.000 m2
- Rebars - 328 ton
- NOREF type quay mass concrete blocks- 1.546 units

Work Summary

Client	APDL Administração dos Portos do Douro e Leixões
Contract Type	Lump Sum
Construction Period	2007 - 2009
Cost	€ 13 000 000,00



Harbour and Coastal Engineering



Lisbon Cruise Liner Terminal - 1st Stage

Santa Apolónia, Lisbon (Portugal)

Work description

The first stage of the job involving the Rehabilitation and Reinforcement of the Quay between Santa Apolónia and Jardim do Tabaco, at a cost of €14 million, has been concluded by a consortium that includes Seth.

Construction of the Santa Apolónia liner terminal is divided into three stages. The first stage involves rehabilitation of the present quay between the Santa Apolónia liner terminal and the Navy Dock, as well as the construction of a new advanced structure, ensuring greater water depth to allow the berthing of present-day liners.

The river-front crown of the new berth now stands at a level of +5.70 m (chart datum), which means that continuity will be given to the present Santa Apolónia Quay with which it is now connected following the conclusion of the job.

The works also involved general dredging of the manoeuvring basin and berthing basin, improvement of the foundation soils involving the construction of aggregate columns, and the reconstruction of the rock-fill prisms and of the landfills behind the existing quay. Besides these, other works were carried out, such as reinforcement of the massif of the superstructure of the existing quay including soil-nailing and sealing fissures, as well as the construction of pile caps, placement of pre-beams, erection of pre-slabs and complementary concrete-pouring work.

The contract also includes construction of a new quay 200 metres long and a variable width of between 33 m and 45 meters, using reinforced concrete piles.

The technical infrastructure works and the fitting out of the quays include the water, electricity and storm-water networks, as well as connecting up with the existing water mains.



Main quantities

- Piles - 204 units (1,000 mm internal diameter piles of an average depth of 36 m)
- Rebar cages - 791,000 kg (piles) 101 000 Kg (pile caps) 223,000 kg (deck slab)
- Concrete - 3400 m3 (deck slab) and 6600 m3 (for the piles)
- Dredging - +- 30 000 m3
- Precast beams - 202 units (283,000 kg of rebar cages and 950 m3 of concrete)
- Precast slabs - 660 units (230,000 kg of rebar cages and 1,300 m3 of concrete)

Work Summary

Client	APL - Administração do Porto de Lisboa
Contract Type	Lump Sum
Construction Period	2007 - 2009
Cost	€ 14 000 000,00





Harbour and Coastal Engineering



New Cruise Liner Terminal – 2nd Stage

Santa Apolónia, Lisbon (Portugal)

Work description

The 2nd stage of the job involving the Rehabilitation and Reinforcement of the Quay between Santa Apolónia and Jardim do Tabaco, at a cost of € 38 million, has been concluded by a consortium that includes Seth.

This stage concluded the rehabilitation of the present quay between the Santa Apolónia liner terminal and the Navy Dock, as well as the construction of a new advanced structure, ensuring greater water depth to allow the berthing of present-day liners.

The river-front crown of the new berth now stands at a level of +5.70 m (chart datum), which means that continuity will be given to the present Santa Apolónia Quay with which it is now connected following the conclusion of the job.

The works also involved general dredging of the manoeuvring basin and berthing basin, improvement of the foundation soils behind the existing quay. Besides these, other works were carried out, such as reinforcement of the massif of the superstructure of the existing quay including soil-nailing and sealing fissures, as well as the construction of pile caps, placement of pre-beams, erection of pre-slabs and complementary concrete-pouring work.

The contract also includes construction of a new quay 475 metres long and a variable width of between 20 m and 55 meters, using reinforced concrete piles.

The technical infrastructure works and the fitting out of the quays include the water, electricity and storm-water networks, as well as connecting up with the existing water mains.

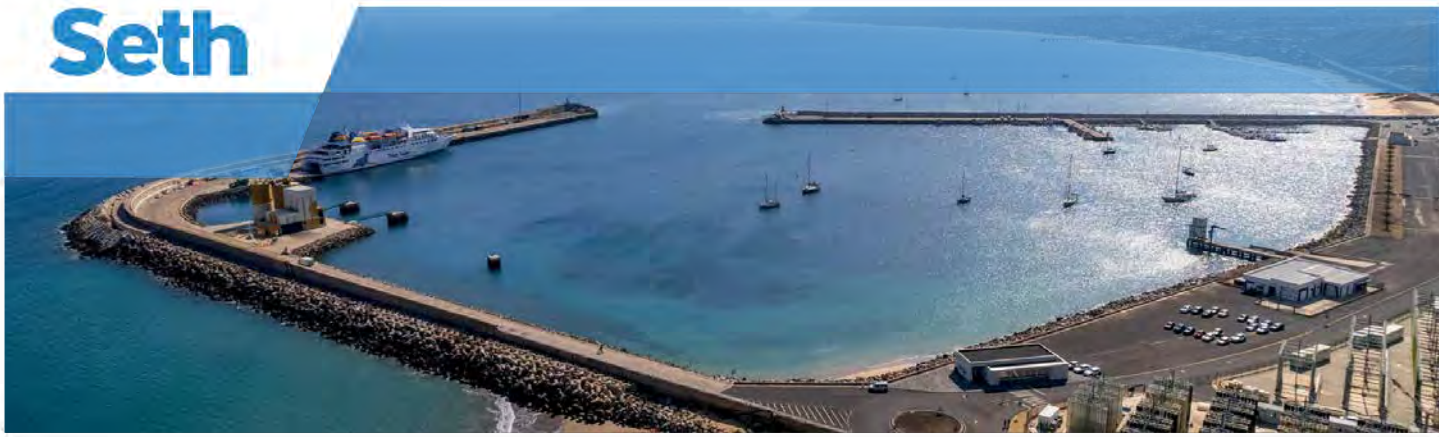


Main quantities

- Piles – 435 units (1,000 mm internal diameter piles of an average depth of 38 m)
- Rebar cages – 1,673,766 kg (piles) 238,937 Kg (pile caps) 629,318 kg (deck slab)
- Concrete – 7,705 m3 deck slab) and 13,062 m3 (for the piles)
- Dredging - 65000 m3
- Precast beams – 513 units (556,000 kg of reinforcement and 2,405 m3 of concrete)
- Precast slabs – 1327 units (438,000 kg rebar cages and 2,587 m3 of concrete).

Work Summary

Client	APL - Administração do Porto de Lisboa
Contract Type	Lump Sum
Construction Period	2009 - 2011
Cost	€ 38 200 000,00



Harbour and Coastal Engineering



Major Repair of the Main Breakwater of the Port of Porto Santo

Porto Santo, Archipelago of Madeira (Portugal)

Work description

This contract was awarded to Seth (in consortium) to carry out the work involved in the Major Repair of the Main Breakwater of the Port of Porto Santo, over a period of two years.

The job involved two distinct parts, marine work and onshore work.

The aim of the onshore work was to improve the quality, safety and working of the container park and of the entire commercial area, involving several roadways along the eastern part of the Quay

The marine work accounted for 90% of the contract and comprised reprofiling the external protection of the breakwater, (East section) consisting of rockfill of up to 0.15 tones and 10-tonne tetrapods, over a distance of 260 m, as well as the reconstruction of the external protection of the breakwater, (South section) consisting of 2-3 tonne rockfill and 30-tonne antifers, over a distance of 460 m.

The placement of the 4,000 30-tonne antifers involved the use of a heavy-lift crane (Manitowock 4100 erected on a "ringer"), sent for the purpose from Mainland Portugal, having the following main characteristics:- Safe working load: placement of 3 tonnes at 50 metres- Total weight of the crane, counterweights and jib: 400 tonnes- Jib with a section of 3 x 2 metres, 61 m long- Crane travel: on rails Fundamentally, the repair consisted of removing the breakwater's protection mantle comprising 10-tonne tetrapods laid with slope of 34° and their replacement by 30 tonne antifers, laid with an inclination of about 26°. The alteration made to the inclination means that the protection of the breakwater extends into the sea by a further 12 to 15 metres, ensuring a greater area for the waves to break.



Main Quantities

- 30-tonne antifers: 4000 units
- 10-tonne tetrapods (new): 350 units
- 10-tonne tetrapods (existing, dismantled and reapplied): 5000 units
- C35/45 concrete: 52,000 m³
- Rockfill 2/3 ton: 85,000 ton
- Dredging sand: 25,000 m³

Work Summary

Client	APRAM Administração do Portos da Região Autónoma da Madeira, S.A.
Contract Type	Lump Sum
Construction Period	2007 - 2009
Cost	€ 19 000 000,00



Harbour and Coastal Engineering



Bulk Terminal, Aveiro Harbour

Gafanha da Nazaré, Aveiro (Portugal)

Work Description

This is the first Portuguese quay-wall employing the combined wall system with sheet-piles and HZ beams.

The quay wall of the bulk terminal consists of a HZ 975 B-14/AZ18 combined wall system from Arcelor anchored with tie-rods to a secondary sheet pile wall.

The key elements are HZ beams with a length of 25.9 m in steel grade S 430 GP. The intermediate sheet pile elements are 20.9 m long AZ 18 sheet piles in steel grade S 355 GP.

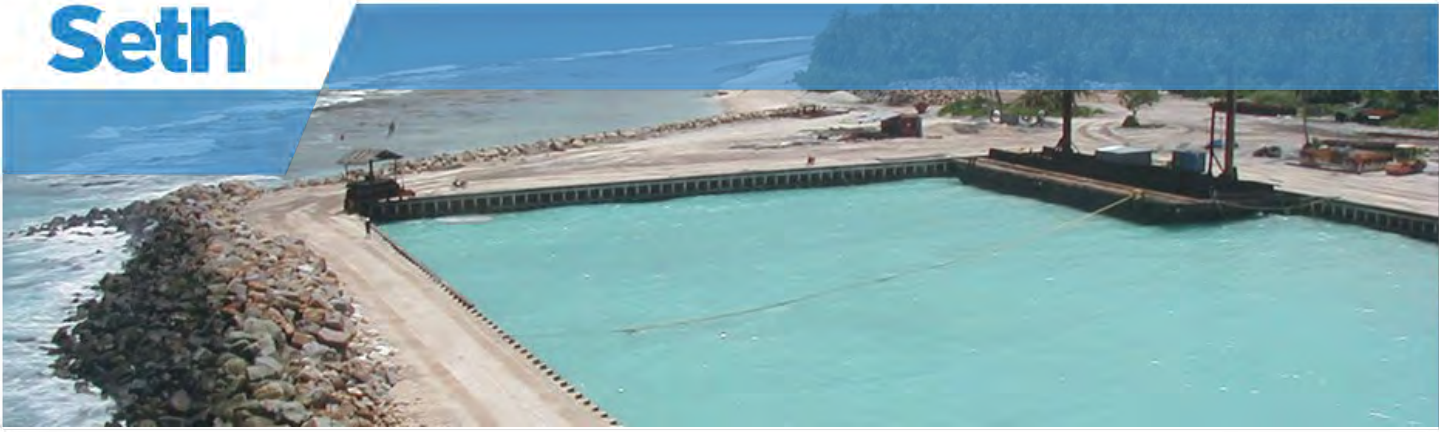
Work included

- Construction of a 750 m long quay;
- Construction of a quay area of 22 000 m² and a gantry rail supported by 642 concrete piles (Ø 1000 mm).
- 4 500 ton of sheet-piles.



Work Summary

Client	APA Administração do Porto de Aveiro, SA
Contract Type	Unit Prices
Construction Period	2001 - 2004
Cost	€ 21 038 183,00



Harbour and Coastal Engineering



Fuah Mulaku Harbour

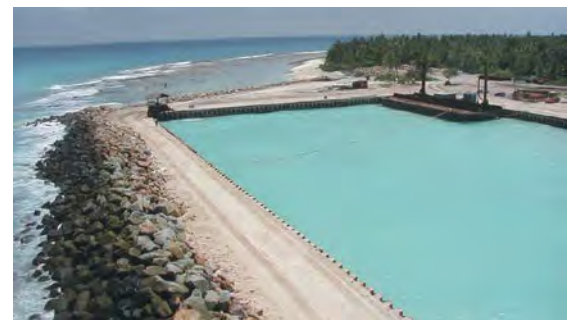
Republic of Maldives

Work description

Construction of a fishing harbour covering an area of 15 000 m² including 500 m of breakwaters, 700 m sheet piling and dredging of approx 80 000 m³ hard coral.

To perform the piling and dredging works, 85 000 kg of explosives were detonated by surface blasting. All in all imported granite stone for the breakwaters, approx. 50 000 tons.

Construction consortium: Hojgaard & Schultz a/s + Seth



Work Summary

Client	Ministry of Construction and Public Works
Contract Type	Lump Sum
Construction Period	2000 - 2002
Cost	€ 9 700 000,00





Harbour and Coastal Engineering



Breakwater Emergency Repair – Stage 1

POL Pier – Praia da Vitória, Azores (Portugal)

Work description

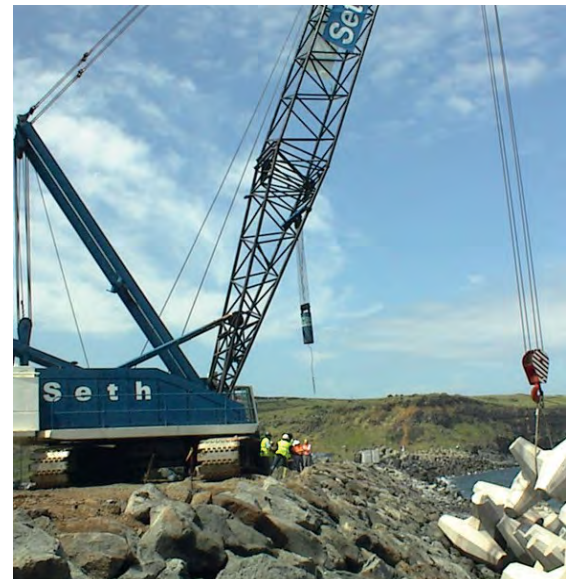
- Crest height: +7.00 Datum
- Bottom depth: – 8.00 Datum
- Pre-fabrication and placement of 20-ton antifer armour blocks: 415 ea.
- Pre-fabrication and placement of 32-ton CORE-LOC® armour blocks: 380 ea
- Armour rock (2 - 9 ton): 5500 tons

NOTE: The world's largest CORE-LOCS ® at the time of this work.

Equipment used

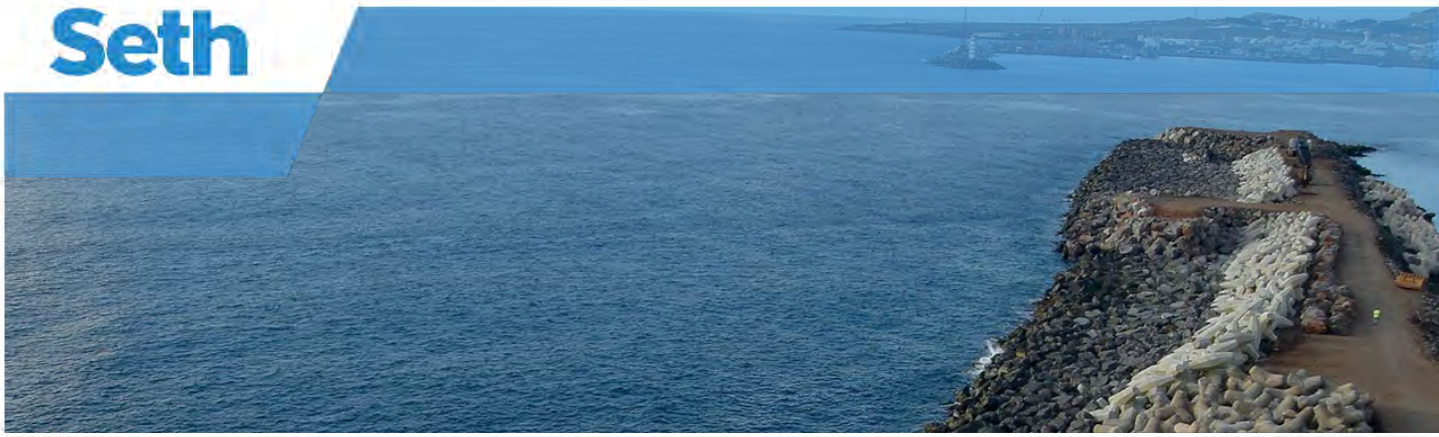
- 1 Crawler crane, 350 tons
- 1 Crawler crane, 250 tons
- 1 Hydraulic excavator, 60 tons
- 3 trailers, 40 tons

Engineering: Transystems Corporation, USA



Work Summary

Client	Brown & Root Services Corp.(US Navy)
Contract Type	Série de Preços
Construction Period	2002 - 2003
Cost	€ 12 600 000,00



Harbour and Coastal Engineering



Breakwater Emergency Repair, Stage 2

POL Pier – Praia da Vitória, Azores (Portugal)

Work description

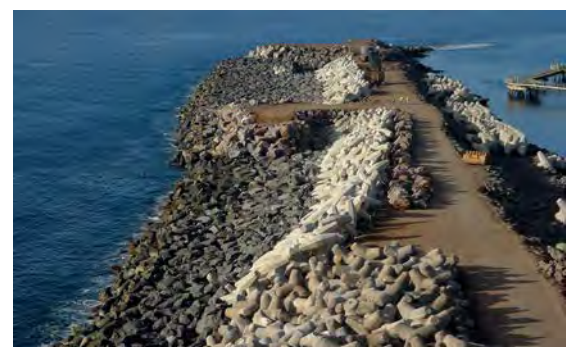
- Crest height: +7.00 Datum
- Bottom depth: – 10.00 Datum
- Pre-fabrication and placement of 33-ton CORE-LOC® armour blocks: 670 ea.
- Armour rock (2,5-20 ton): 175.500 tons

NOTE: The world's largest CORE-LOCS® at the time of this work.

Equipment used

- 1 Crawler crane, 350 tons
- 1 Crawler crane, 250 tons
- 1 Hydraulic excavator, 60 tons
- 3 trailers, 40 tons
- 1 Komatsu WA600 (60T)

Engineering: Transystems Corporation, USA



Work Summary

Client	Brown & Root Services Corp.(US Navy)
Contract Type	Price Series
Construction Period	2004 – 2006
Cost	€ 24 600 000,00





Harbour and Coastal Engineering



Breakwater Emergency Repair – Stage 3

Military Port, POL Pier – Praia da Vitória, Azores (Portugal)

Work Description

The third and final stage of the reconstruction of the North Breakwater of Praia da Vitória Bay, a contract that the US Navy had awarded to Seth, on November 1, 2007, was concluded in March 26, 2009.

The job in question, budgeted at about € 8.5 million, took 15 months (3 months ahead of the date scheduled by the customer) and it involved the following tasks and quantities:

- Conclusion of the protection crown (30 metres wide) around the head, involving application of 19,300 tonnes of rock-fill of between 8 and 22 tonnes;
- Reprofilling the body of the breakwater over a distance of 540 m and application of 66,300 tonnes of rock-fill of between 2,5 and 8 tonnes used in the construction of the protection mantle along the inner side of the breakwater;
- Pre-fabrication of 392 C60/75 concrete Core-locs reinforced with 50mm synthetic-fibre;
- Placement of 516 new 33-tonne Core-locs;
- Shifting and replacing 100 existing Core-locs;
- Shifting and replacing 120 Antifers each of 20 tonnes;
- Concreting the superstructure of the head and placement of the Port of Praia da Vitória approach light having a visual range of 10 nautical miles.

NOTE: The world's largest CORE-LOCS ® at the time of this work.

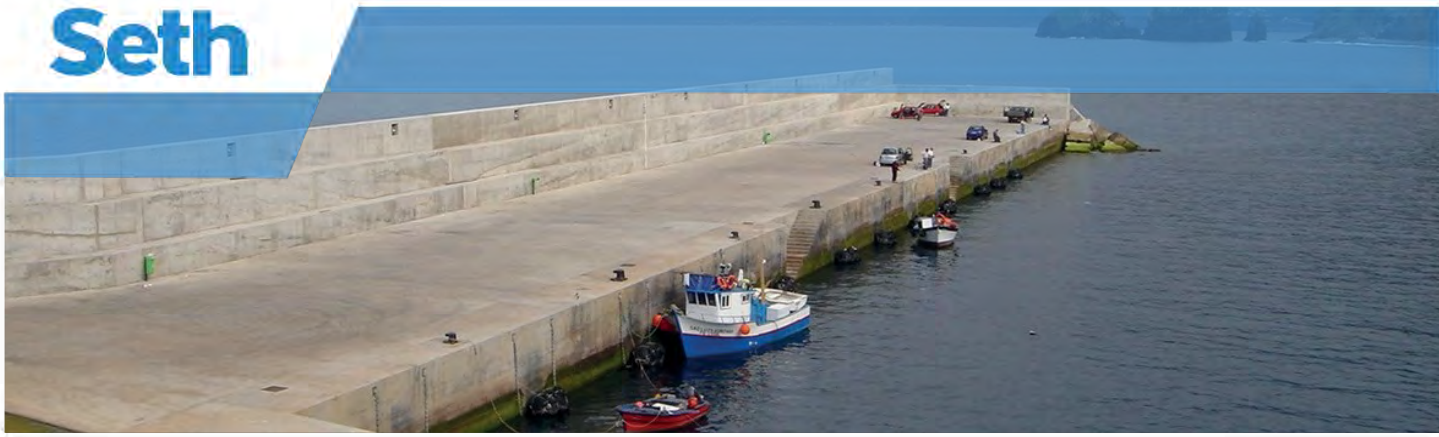
Equipment used

- 1 Crawler crane, 350 tons
- 1 Crawler crane, 250 tons
- 1 Hydraulic Excavator, 60 tons
- 3 trailers, 40 tons
- 1 Wheel Loader Komatsu WA600 (t0 ton)

Work Summary

Client	US Navy United States Navy
Contract Type	Lump Sum
Construction Period	2007 - 2009
Cost	€ 8 500 000,00





Harbour and Coastal Engineering



Porto Moniz Harbour

Porto Moniz, Archipelago of Madeira (Portugal)

Work description

- Construction of berthing quay
- Caissons laid at -8,0 m below datum level
- Concrete access viaduct

Work volume

- Pre-fabrication and placement of 50 ton antifer armour blocks: 2100ea
- Pre-fabrication and placement of 5 concrete caissons (25m x 15m x 13m each one)
- Stone volume: 200.00m³



Work Summary

Client	APRAM (Madeira)
Contract Type	Unit Price
Construction Period	2002 - 2003
Cost	€ 18 352 751,00



Harbour and Coastal Engineering



U.S. Navy - POL Pier

Terceira Island, Azores (Portugal)

Work description

The construction of the dock of fuels and lubricants of Praia da Vitória, to support the activities of the US Armed Forces stationed at Lajes, Azores, involved the implementation of the following infrastructure:

- Concrete wharf with 260 m in length (including 1 Duke d'Alba), with foundations on steel piles 40 m long. Depth at the top of the pier: 14 m, usable by ships with a draft up to 12 m.
- Breakwater protection trapezoidal cross section with 650 m length, involving 500,000 m³ rockfill.
- Construction of a multi-product pipeline to refined petroleum products 2500 m long. More recently, in 1982, SETH also performed several works by enhancing the breakwater and in 1989 installed a new cathodic protection system imposed current.

Work volume

- Total concrete volume: 75 000 m³
- Driven piles: 40 m comp./length
- Breakwater: 650 m / 500 000 m³
- Pier: 260 m
- Draught: 12 m

Inspection agency: Naval Facilities Engineering Command/ USA



Work Summary

Client	U.S. Navy
Contract Type	N/D
Construction Period	1962 - 1963
Cost	N/D





Harbour and Coastal Engineering

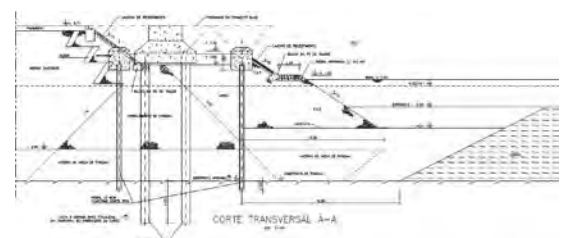
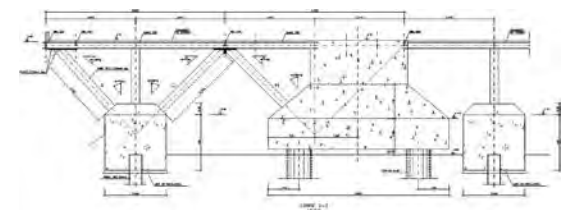


EXPO'98 -Closure Dyke and Lock

Lisbon (Portugal)

Description of works

- Sheet-piles -1000 ton
- Construction of a cofferdam for canal dock
- Construction of steel structures and installation of mechanical equipment - 200 ton
- Dredging - 1 000 000 m3 (including transport and discharge on the sea)
- Enrocamento - 150 000 m3



Work Summary

Client	Parque EXPO, SA
Contract Type	Turn-Key
Construction Period	1998
Cost	PTE 3 200 000 000





Harbour and Coastal Engineering



Arrifana Fishing Harbor

Maintenance and Upgrading Works

Arrifana, Aljezur (Portugal)

Work description

- Dredging of the inner basin
- Length and height increase of the breakwater
- Stability improvement of the surrounding cliffs
- Construction of retaining walls around the inner basin
- Repairs to the boats ramp
- Volume de enrocamento: 6000 m³
- Armor stone volume: 6000 m³

Designer / Engineer: Consulmar

Inspection Agency: Instituto Marítimo e Portuário



Resumo da Obra

Client	Instituto de Conservação da Natureza
Contract Type	Unit Prices
Construction Period	1999 - 2000
Cost	€ 545 000,00



Harbour and Coastal Engineering

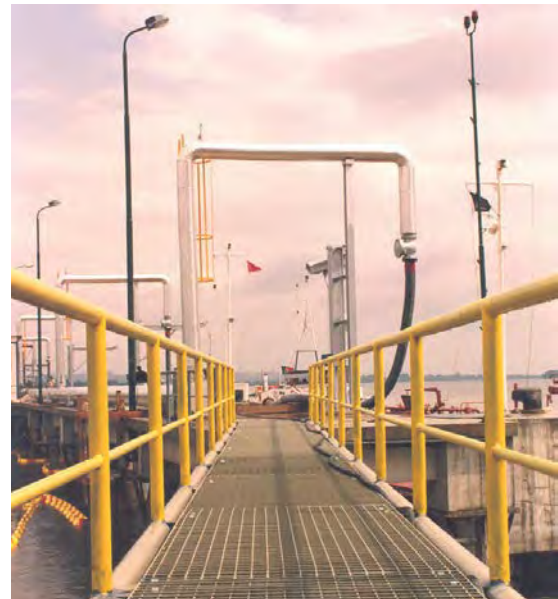


Fuel Pier Extension

Carregado Power Plant (Portugal)

Description of Works

- Demolition of the existing dolphins.
- Driving of Ø 500 and Ø 700 tubular steel piles.
- Prefabrication of structural elements of reinforced concrete.
- Construction and assembly of the steel structures (walkways connecting to the dolphins and fender attachment belts).
- Supply and assembly of fenders.
- Study, supply and assembly of the spill prevention system, comprising:
 - floating barriers;
 - racking motor pump;
 - flexible tanks;
 - disc recovery.



Work Summary

Client	EDP Electricidade de Portugal, SA
Contract Type	Turn-Key
Construction Period	1993
Cost	PTE: 290 000 000,00





Harbour and Coastal Engineering



Phoenix Project - Pier 3 Extension

Lisnave Internacional, SA, Setúbal (Portugal)

Description of Works

The extension of Pier No. 3 of the Lisnave Setúbal Shipyards was carried out in 2 phases: 53 x 18 m (1st Phase) and 15 x 14 m (2nd Phase).

The new quay was supported by ground-shaped piles in the following quantities and dimensions:

- 36 piles with Ø 1000 mm
- 69 piles of Ø 800 mm
- The dredging carried out was intended to improve navigation in the maneuvering basin and to lay the foundations of the quay structure.
- The work also included the protection of buildings with rockfill prisms, several fluid gutters, the construction of a Dolphin and several works for the recovery of Pier #1.
- Dolphin was founded on a 15 x 8 m shoe and integrated into a 14 x 7 m top slab.
- The volume of core filling sands totaled 900 m3.



Work Summary

Client	Lisnave Int'l, SA
Contract Type	Turn-Key
Construction Period	1995 - 1996
Cost	PTE: 526 000 000



Harbour and Coastal Engineering



Construction of Ramp and Ancillary Quay

Tavira Nautical Club (Portugal)

Work description

Construction of a boats ramp and ancillary quay

Driven steel piles: Ø 508 mm, 22 ea



Work Summary

Client	Câmara Municipal de Tavira
Contract Type	Unit Prices
Construction Period	1999
Cost	€ 361 000,00





Harbour and Coastal Engineering



Water Intake and Discharge Pipping

**Combined Cycle Central Power
Lares - Figueira da Foz (Portugal)**

Work Description

Seth, S.A. executed, in consortium, the contract for the execution of the Water Intake and Discharge Pipping for the EDP Combined Cycle Central Power, at Lares (Figueira da Foz).

The work consisted in implementing the aforementioned water outlet at the Mondego River and the work realized basically water intake and pumping wells, in reinforced concrete structures, executed by the method of molded walls and the micro tunnelling execution water intake and discharge pipping.

During the contract it was also need to implement some cofferdams in "Larsen" sheet piles.

Around the water intake box was performed a slab in "Reno mattresses", over a rock fill foundation with about 1.0 m thick, for protection of this slab were performed "wing" walls in gabions.

Main jobs

- Micro tunnelling
- Horizontal drilling
- Shapped walls
- Cofferdams
- Dredging
- Gabions and mattresses underwater
- Submerged concrete



Work Summary

Client	EDP – Energias de Portugal, SA
Contract Type	Lump Sum
Construction Period	2008 - 2009
Cost	€ 2 990 000,00





River Engineering



Improvement Salamonde Dam

Bacia do Cávado-Rabagão, Vieira do Minho (Portugal)

Work Description

Execution of all construction works of the new Hydroelectric Power Salamonde II, which is intended to strengthen power installed in hydroelectric Salamonde, situated in Vieira do Minho, Braga district.

Scope of work

Independent and underground hydraulic circuit with 2.2 km total length, composed of the following elements:

- Water intake in the Albufeira Salamonde;
- Section of underground adduction;
- Section of restitution between the Central and the connection to the balancing chimney;
- Balancing chimney;
- Tunnel Return;
- Restitution in Albufeira Caniçada;
- Downstream channel dug in the bed of the River Cávado;
- Underground Central;
- Building support and substation;
- Access tunnels and attack;
- Heap and diversion of Rio Mau;
- Cofferdams Water Outlet, restitution and complementary flood spillway;
- Complementary Flood spillway with supply and assembly of equipment.



Main quantities

- Earth moving: 765 000 m3;
- Concrete: 130,000 m3
- Steel: 9,100,000 kg

Work Summary

Client	EDP – Gestão da Produção de Energia, SA
Contract Type	Lump Sum
Construction Period	2011 – 2015
Cost	€ 125 000 000,00





River Engineering



Inlatable Weir at Coruche

Coruche (Portugal)

Work Description

Seth completed the work of the Inlatable Weir (river Sorraia) in Coruche. The work of Dam Coruche, launched by the Municipality of Coruche, is part of the Recovery Plan Marginal Sorraia River allowing residents to enjoy a new social facilities, unique features.

The water mirror thus created upstream of the dam enhances the practice of fishing contests and events, recreational motorboats, and other footpaths.

The dam consists of a main body, reinforced concrete, crossing the entire river, and a metal catwalk, a pedestrian extension of 62 meters, which allows the passage from one to the other side.

The indirect foundations of the complex consist of a set of 62 reinforced concrete piles, cast on the ground, with 800 mm diameter and 16 m deep.

The inflatable weir is still complex consists of:

- A house of Control
- A house of Command
- An observation room for fish
- A fish ladder.

Main quantities of work

- Concrete: 3.970 m3
- Rubble concrete: 45 m3
- Shuttering: 974 m2
- Steel: 272.000 Kg
- Acesses: 800 m3
- Excavation: 2.300 m3
- Inflatable sluice gates: Span 1: c/ 30 meters / Span 2: c/ 30 meters
- Diameter: 2,5 meters
- Material: semi-synthetic rubber reinforced with polyester mesh

Architect and Engineer: Hidroprojecto



Work Summary

Client	Câmara Municipal de Coruche
Contract Type	Chave-na-Mão
Construction Period	2011 - 2012
Cost	€ 2.291.885,00





River Engineering



Inflatable Weir at Abrantes

Abrantes (Portugal)

Work Description

As part of a consortium Seth concluded the River Tagus Inflatable Weir job at Abrantes. The job, awarded by the Abrantes City Council, was finalised in 670 working days and it included the design of the project and the construction of what is, to date, the Iberian Peninsula's biggest weir of its type.

One of the goals of this job was to create a reflecting pool upstream of the weir at a predetermined level, allowing the reservoir created between the city of Abrantes and Rossio ao Sul do Tejo to be used for leisure and entertainment purposes.

Fundamentally, the weir comprises a reinforced concrete body with a portico-shaped cross section about 15 metres wide and 200 metres long, with a variable depth of about 6 metres. The superstructure comprises 4 piers 5.5 metres tall that form four spans that can be blocked by means of cylindrical rubber bodies, the first having a perimeter of 1.20 m and the others 3.2 m. The 5th span comprises a reinforced concrete sluice.

Of the complementary organs, attention is drawn to the reinforced fish house (a zigzag labyrinth) located on the left bank surrounding the respective abutment, and to the control room where the equipment required to operate the weir is located (insufflators, valves, electrical installation, automation, emergency generators, plc automated control, etc.). The access roads to the weir are also part of the project..



Main quantities of work

- Concrete: 25 000 m³
- Rubble concrete: 5 000 m³
- Shuttering: 9 500 m²
- Steel: 1 500 ton.
- Accesses: 8 800 m²
- Excavation: 16 000 m³
- Excavation in rock: 8 500 m³
- Inflatable sluice gates:
 - Span 1 (weight 2.1 tonnes – thickness 10.8 mm)
 - Spans 2, 3 & 4 (weight 3 x 4.7 tones / thickness – 13.5 mm)

Work Summary

Client	Câmara Municipal de Abrantes
Contract Type	Design/Construction
Construction Period	2004 - 2007 (670 dias)
Cost	€ 9 450 290,00





River Engineering



Rehabilitation of the dams at Arrabalde and Salgadas (1 of 2 pages)

Arrabalde (Portugal)

Inflatable Weir at Arrabalde

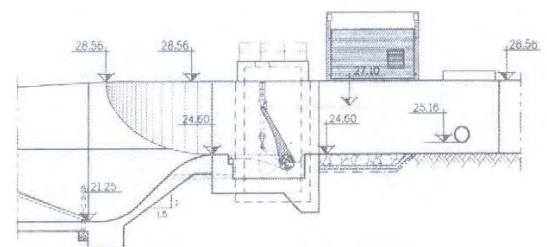
This dam is located approximately 14.3 kilometers to the river Lis, a section located to the west of the city of Leiria next "field of the fair." This hydraulic structure is fundamental part of the irrigation system of the fields of the Valley of Lis. It is through this that creates the reservoir water level necessary to enable the abstraction of water for irrigation.

The rehabilitation of the dam Arrabalde's main goal was to allow the automatic triggering of the two gates, inserted in the body of the dam, and water intakes in order to allow, in accordance with the needs of water and streams and tributaries downstream requested, optimization of their operation.

From the structural point of view, the solution rehabilitation forced the demolition of the old central area of the dam wall and sill, for placement of new gates. This intervention took place, on both sides, with the curtains crimping sheet pile walls in masonry of the dam, to ensure the stability of the work and the surrounding land during the demolition of existing walls and the sill.

The implementation of the new dam, comprised the construction of two side meetings, a central pillar and from two wells, one on each bank, which host the servo motors driving the floodgates.

The work also included the automation of the two water intakes for irrigation.



Main quantities of work

- Type of floodgates – Hinged gates
- Width of the sealed openings - 7,75m
- Height of the sealed opening - 2,50m
- Number of gates - 2
- Threshold quota - 24,60m
- NPA quota - 27,10m
- Platform quota - 28,56m
- Maximum load - 2,5 m.c.a.
- Gate maneuver - At full load
- Cofferdam maneuver - In balanced waters

Work Summary

Client	IHERA - Instituto de Hidráulica, Engenharia Rural e Ambiente
Contract Type	Turnkey
Construction Period	2000 - 2001
Cost	€ 1 920 371,91 (os dois açudes)



River Engineering



Rehabilitation of the dams at Arrabalde and Salgadas (2 of 2 pages)

Salgadas (Portugal)

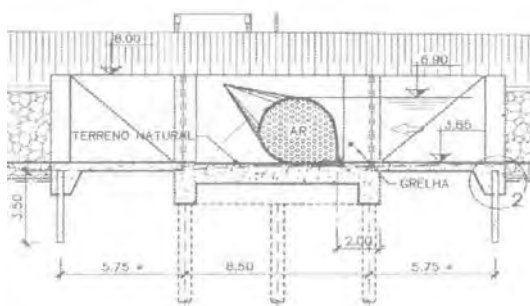
Inflatable Weir at Arrabalde

The dam of Salgadas located approximately 30 kilometers to the river Lys, near Mount Royal, a section of the bed and settled contributes more as a fundamental part of the irrigation system of the fields of the Valley of Lis.

The rehabilitation of the dam's main goal was to replace the existing structure that was obsolete (about 50 years), creating a plan to allow sufficient water supply to the needs of water and flow downstream requested by making water in the left margin.

The work consisted of a "inflatable dam" which broadly comprises a threshold based on eight concrete piles with 60 cm diameter and depth between 18 and 24 meters, in which a chamber is recessed synthetic rubber reinforced.

The rehabilitation also included the automation of irrigation water outlet.



Main quantities of work

- Gate type – Inflatable
- Width of the sealed opening - 7,00m
- Height of the sealed opening - 3,25m
- Slope of the side walls: 1 (V) 1 (H)
- Number of gates- 1
- Threshold level - 3,65m
- NPA quota - 6,90m
- Platform quota - 8,00m

Work Summary

Client	IHERA - Instituto de Hidráulica, Engenharia Rural e Ambiente
Contract Type	Turnkey
Construction Period	2000 – 2001
Cost	€ 1 920 371,91 (os dois açudes)



Transmission and Distribution Works



Emergency Rehabilitation Works for the EDM Power Distribution Network

Zambezia Province, Mozambique

Works performed

Emergency rehabilitation and construction works involving 125 km of medium-voltage (MV) overhead lines and 20 km of low-voltage (LV) overhead lines, as well as the rehabilitation of EDM's customer support buildings and warehouse in Quelimane following Cyclone Freddy. Contract funded by the World Bank.

Key Quantities

- MV wooden poles: 420 un.
- LV wooden poles: 520 un.
- MV concrete poles: 1300 un. MV AAAC Conductor: 410 km
- LV Cable: 20 km Transformers: 6 un.
- Street Lighting: 120 un
- Factory testing and training of EDM staff and implementation of CSMP program.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Série de Preços
Construction Period	2024 - 2026
Cost	€ 5 063 398,00





Transmission and Distribution Works



Line C31 (SE Nampula 220 - SE Nampula Central Substation) Conductor Replacement and OPGW installation

Nampula Province, Mozambique

Work performed

Replacement of ACSR Dove conductor with ACCC Lisbon Work carried out on 16 towers (10 tension towers and 6 suspension towers) and installation of OPGW cable.

Work specifications

- Line length: 5.0 km
- Nominal voltage: 110.0 kV
- Maximum voltage: 123.0 kV
- Frequency: 50 Hz
- Conductor per phase: 1 x Lisbon
- Smax: 199 MVA
- Phase arrangement: Triangular
- Insulators used: Composite
- Cable/OPGW: OPGW (48 fibers)



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Valor Global
Construction Period	2023
Cost	€ 298.271,03 (19.149.000,00 MZN)





Transmission and Distribution Works



STIP Lot D 110 kV, Dondo - Munhava

Sofala, Mozambique

Description of Works

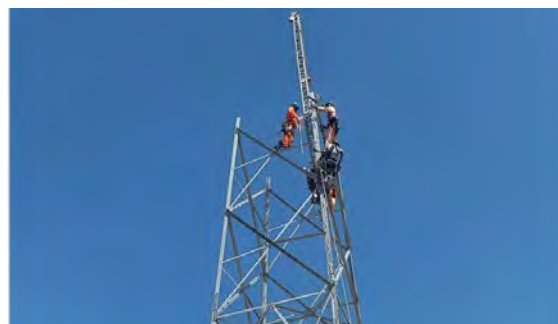
Dismantling of the existing 110kV Transmission Line between the localities of Dondo and Munhava, in Sofala Province, and construction of a new (RESILIENT) 110kV overhead transmission line consisting of micro-pile and reinforced concrete foundations, lattice steel towers, glass insulators, double circuit/single ACSR conductor, and OPGW.

Replacement of the conductor on CL71.

Embankment with granular material for access to flooded areas.

Main Quantities

- Towers – 79 units
- Conductor – 156 km
- OPGW – 52 km
- Bored micro piles – 484 units/5.812 m



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re.measurable
Construction Period	2022 - 2025
Cost	€ 8 447 128,67





Transmission and Distribution Works



PCIREP – 66 (110) kV Line Lamego - Guaraguara

Sofala, Mozambique

Description of Works

Post Post Cyclone Idai and Kenneth Emergency Recovery and Resilience Programme for Mozambique (PCIREP)– Transmission Lines. Dismantling of the existing 66kV Transmission Line between the localities of Lamego and Guaraguara in Sofala Province, and construction of a new 110kV overhead transmission line consisting of micro-pile and reinforced concrete foundations, lattice steel towers, glass insulators, single circuit/single ACSR conductor, and OPGW.

Main Quantities

- Towers – 200 units
- Conductor – 210 km
- OPGW – 70 km
- Bored micro piles – 996 units / 6131 m



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-measurable
Construction Period	2022 - 2024
Cost	€ 5 591 669,00



Transmission and Distribution Works



Rehabilitation of Distribution Networks - Perip Lot 4

Maputo – Mozambique

Description of Works

Power Efficiency and Reliability Improvement Project (PERIP) - Lot 4: Rehabilitation of Distribution Networks at Maputo and Matola (Medium and Low Voltage Systems).

Workfinanced by World Bank.

Main Quantities

- 1250 wooden posts for Medium Voltage lines;
- 1300 concrete posts for Medium Voltage lines;
- 550 km of conductor for the execution of approximately 190 km of Medium Voltage lines;
- 105 km of ADSS (optical fiber);
- 100 MT/LV transformers;
- 5000 wooden posts for Low Voltage lines;
- Connection of 6,000 new consumers;
- Two 25 m high metal lattice towers for crossing the river.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Unit Price
Construction Period	2020 – Trabalhos em andamento
Cost	USD 11 177 344,86





Transmission and Distribution Works



Reinforcement and Extension of the National Power Transmission Grid

Maputo, Gaza, Inhambane, Zambézia, Nampula – Mozambique

Description of Works

SETH is executing (in consortium) another electricity transmission and distribution contract in Mozambique.

The turnkey contract involves the construction of 140 km of 275 kV power line between Ressano Garcia and Macia, 100 km of 110 kV power line between Lindela and Massinga, the intervention / construction of 10 (ten) substations in the provinces of Maputo, Inhambane, Zambezia and Nampula, namely Ressano Garcia, Ndzimbene (Macia), Lindela, Massinga, Maxixe, Alto Molocue, Central Nampula, Chimuara, Quelimane and Maputo 275 (Beluluane).

The contract value is around EUR 121 million and is funded by the Danish cooperation agency DANIDA, the client being EDM- Electricidade de Moçambique, EP.

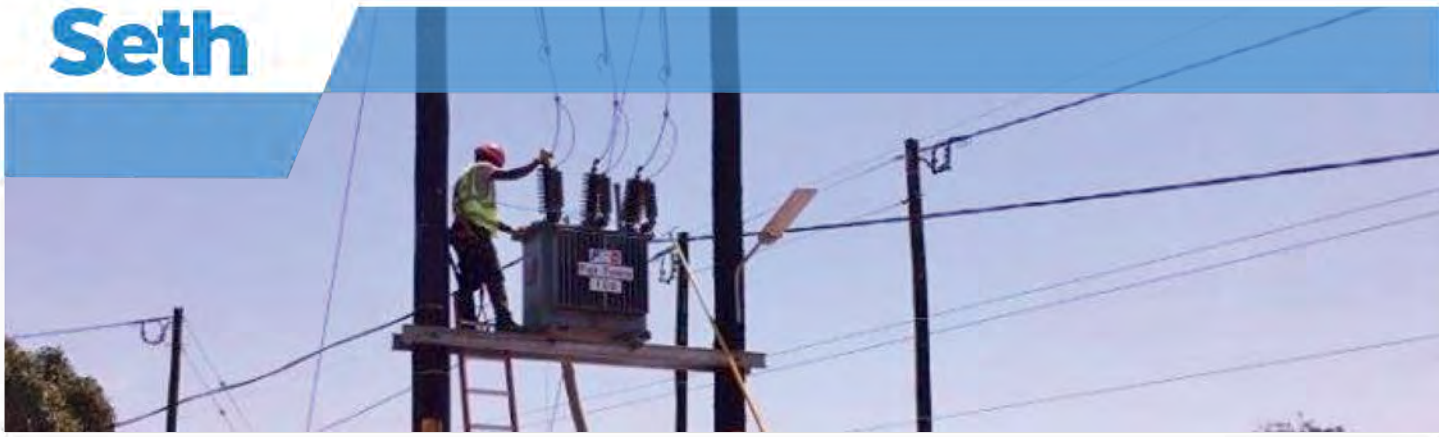
In this contract, the technology partner for substations is ABB AB (Asea Brown Boveri) and, the implementation period is 78 months.



Work Summary

Client	EDM - Electricidade de Moçambique
Contract Type	Lump Sum
Construction Period	2013 – 2020
Cost	€ 121 000 000,00





Transmission and Distribution Works



EDAP (Energy Development Access Program)

Maputo, Tete, Nampula and Manica - Mozambique

Description of Works

A EDM- Electricidade de Moçambique, EP has awarded SETH 5 (five) lots of the Energy Development Access Program (EDAP) project.

The projects concerned consist of the construction of about 200 km of medium voltage lines at 33 kV, 1000 km of low voltage lines, including the installation of 335 (three hundred and thirty-five) distribution transformers and the connection to about 66,000 (sixty-six thousand) consumers.

The overall amount of the 5 contracts amounted to 38,850,000.00 (United States dollars).

Each contract is independently executed and has a duration of eighteen (18) months, covering the provinces of Maputo, Tete, Nampula and Manica, being financed by the World Bank, OFID (The OPEC Fund for International Development), the European Investment Bank, and by the French Agency for Development.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-measurable
Construction Period	2014 - 2020
Cost	USD 38.850.000,00





Transmission and Distribution Works



New 33 kV Line to feed Nhamapaza

Nhamapaza and Canxixe (Sofala Province) - Mozambique

Description of Works

Construction of approximately 85 km of medium voltage 33 kV overhead line, supply and assembly of 11 transformer stations and execution of low voltage networks and public lighting.

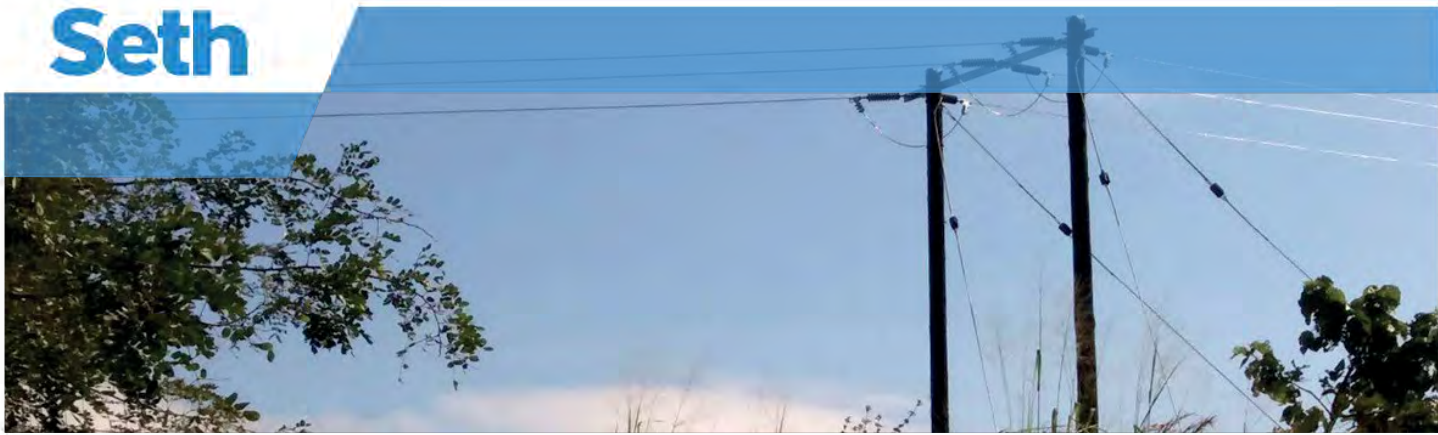
The main objective of the work was the power supply of the Canxixe and Nhamapaza Administrative Posts, from Maríngue, in the province of Sofala.

The existing clusters along the line have also been linked to the power grid.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-Measurable
Construction Period	2018 - 2019
Cost	USD 1 900 000,00



Transmission and Distribution Works



33 kV Line between Chemba and Tambara

Manica and Sofala Provinces - Mozambique

Description of Works

Installation work of approximately 100 km of 33 kV medium voltage overhead line in a very dense vegetation area. The works were part of the Electricity IV project.



Work Summary

Client	Efacec/EDM – Electricidade de Moçambique
Contract Type	Re-Measurable
Construction Period	2018 - 2019
Cost	€ 250 000,00





Transmission and Distribution Works



Refurbishment of a 66 kV Transmission Line

Boane, Infulene, Matola Gare - Mozambique

Description of Works

The work consisted of the design and construction of a 45 km 66 kV airline between the Boane, Infulene and Matola Gare substations, including the dismantling of some sections of the existing line and the execution of temporary deviations in order to ensure the operability of the existing line. replace during the construction period. The construction solution adopted was made of galvanized steel poles with reinforced concrete foundations.

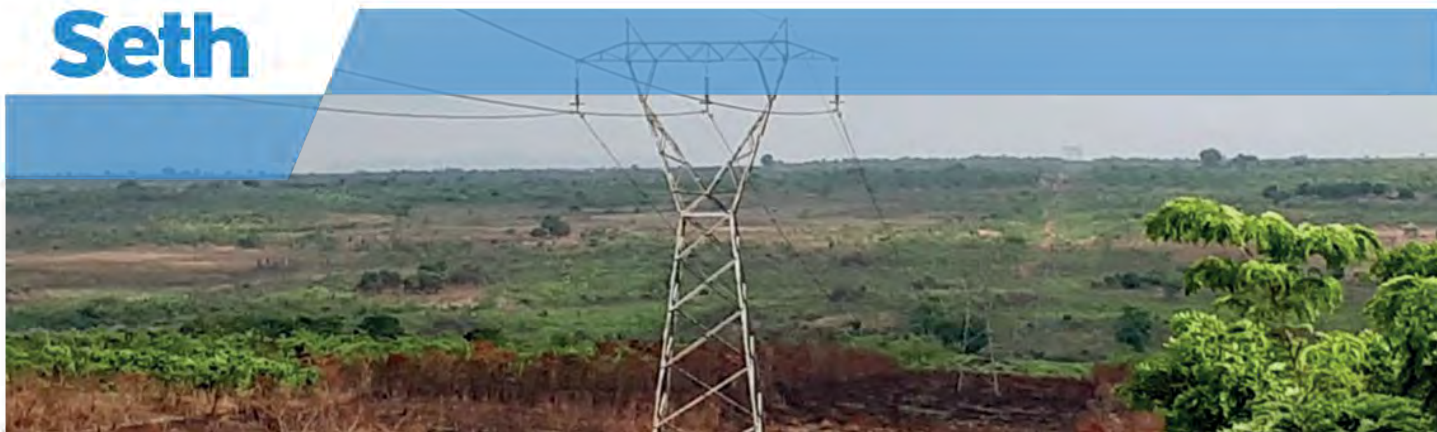
The work also included the passage of the conductor (double) and the optical fiber (OPGW).



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-Measurable
Construction Period	2016 - 2018
Cost	€ 8 400 000,00





Transmission and Distribution Works



OPGW, ADSS and OPUC installation in a 220 kV OHL between Chicamba, Mavuzi and Chibata

Manica - Mozambique

Description of Works

The work consisted of the conception and execution of the placement of approximately 100 km of OPGW, ADSS and OPUC type optical fiber in the 220 kV line between Chicamba, Mavuzi and Chibata substations, as part of the Hydroelectric Power Plants Rehabilitation project. Chicamba and Mavuzi, a project developed for the Electricity of Mozambique, EP funded by AIDS, AFD and KFW.



Work Summary

Client	Cegelec (Groupe Vinci) / EDM, E.P.
Contract Type	Lump Sum
Construction Period	2018
Cost	€ 900 000,00



Transmission and Distribution Works



New underground 22 kV UG lines in Chimoio and Beira

Beira and Chimoio (Sofala and Manica) - Mozambique

Description of Works

Construction of approximately 7 km of 22 kV buried medium voltage line, including all civil works and pavement replacement, to feed the new branches under construction of the Bank of Mozambique in the cities of Beira and Chimoio.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-Measurable
Construction Period	2018
Cost	USD 900 000.00





Transmission and Distribution Works



New 33 kV Line to feed the Vunduzi Administrative Post

Vunduzi, Gorongosa (Sofala) - Mozambique

Description of Works

Supply and installation of approximately 40 km of 33 kV medium voltage overhead line, supply and assembly of 8 160 kVA transformer stations, execution of low voltage networks and public lighting.

The main purpose of the work was the power supply of the Vunduzi Administrative Post, located on the edge of the Gorongosa Mountain Range, a region previously affected by military hostilities.

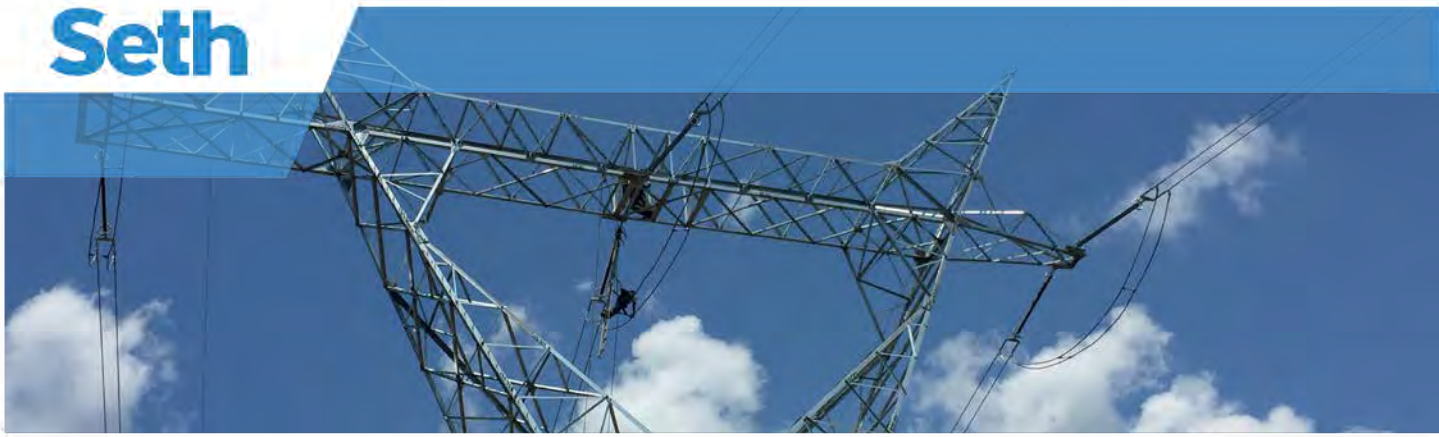
The existing clusters along the line have also been linked to the power grid.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-Measurable
Construction Period	2017
Cost	€ 1 300 000,00





Transmission and Distribution Works



Restoration of 220 kV Transmission Line Section

Mocuba (Zambezia Province) - Mozambique

Description of Works

A EDM- Electricidade de Moçambique, EP has awarded Seth an emergency repair contract for a 220 kV high-voltage section of the line, which was devastated by the January 2015 floods in Mocuba, Zambezia province.

The work was completed in six months and consisted of the repair of a 220 kV section of the power transmission line, approximately 10 km long.

Works included line engineering, supply and assembly of all materials, including 12 towers with heights between 27 and 50 m, 60 km of conductor and 20 km of GSW.

Two (2) special reinforced concrete foundations, based on micropiles, were built on the banks of the Licungo River.



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Re-measurable
Construction Period	2015
Cost	€ 3 415 377,00





Transmission and Distribution Works



Nacala Coal Harbour Substations

Nacala-a-Velha - Mozambique

Description of Works

"Nacala Coal Harbor Main (110/22/33 kV) and Secondary Substations" is the name of the contract that Siemens Pty Limited- Mozambique Branch has awarded to Seth.

The scope of the works included all the civil construction associated with the substations of the new coal export terminal of the Port of Nacala, in Nacala-a-Velha, namely the works of:

- Earth moving;
- Reinforced concrete in foundations;
- Cable channels;
- Oil and water drainage systems;
- Pavements and fences on access roads and in the yard.

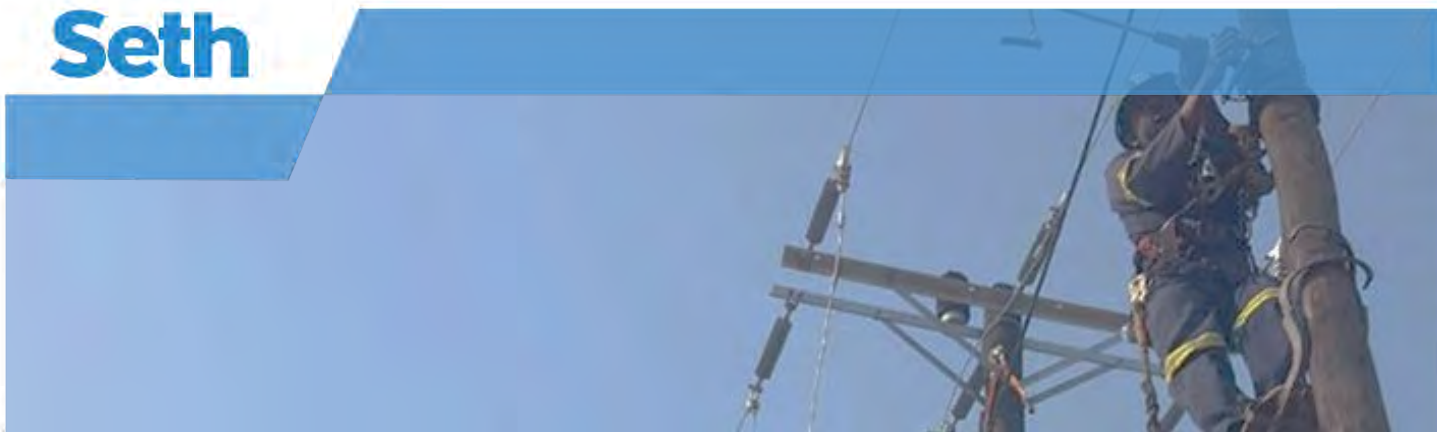
Main quantities

- 5,000 m³ of earthmoving
- 2,500 m³ of reinforced concrete
- 300 tons of steel in reinforcement
- 1,000 m² of paving



Work Summary

Client	Corredor Logístico Integrado de Nacala (Vale)
Contract Type	Re-measurable
Construction Period	2014
Cost	€ 1 565 000,00



Transmission and Distribution Works



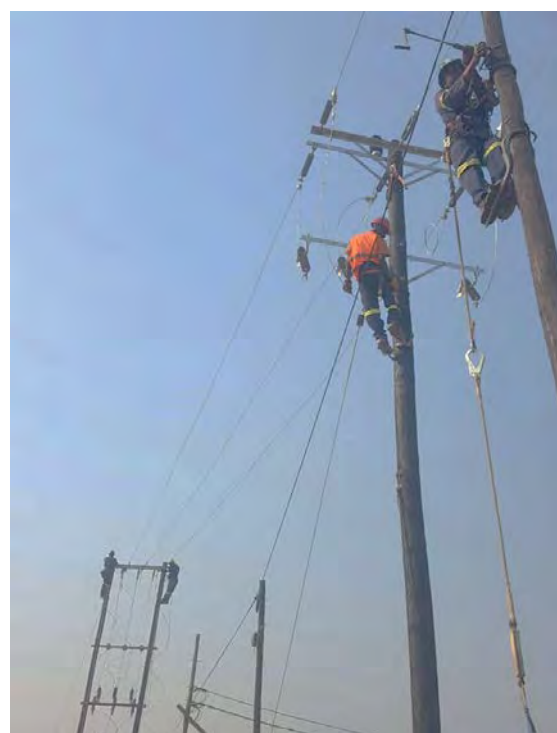
New 33 kV Mabalane – Combomune

Gaza Province - Mozambique

Description of Works

Approximately 50 km of medium voltage 33 kV overhead line under emergency conditions in a dense vegetation area during a rainy season.

The structural solution adopted was wooden poles with metal sleepers, ceramic insulators and AAAC 150 mm² conductor.



Work Summary

Client	EDM – Electricidade de Moçambique, E.P.
Contract Type	Re-Measurable
Construction Period	2013 - 2014
Cost	USD 500 000,00





Transmission and Distribution Works



Grid Intensification Component - ERAP, Package III

Maputo - Mozambique

Description of Works

Energy Reform and Access Program (ERAP), Package III is the name of the contract that EDM- Electricidade de Moçambique awarded to Seth through funding from the NDF (Nordic Development Fund).

This contract had a 21-month implementation period and involved the construction of around 295 kilometers of medium and low voltage power distribution lines in various neighborhoods around Maputo, as well as their final connection to approximately of thirty thousand end consumers.

Of course, the project included an initial survey of the neighborhoods, the implementation of the distribution project of the lines to be installed, as well as the supply and installation of all materials and equipment such as poles, lines, transformers and meters.

Three sections were part of the contract: Section 3, consisting of large farms south of Maputo, in Catuane, near the border with South Africa; Section 2 on the outskirts of Maputo; and Section 1, also in the outskirts of Maputo, where a large part of this contract was located and which represents the largest amount of the works awarded.

Main quantities

- Connection of 30000 end consumers
- 114 transformers from 25 to 315 kVA
- 137 Kms of medium voltage lines
- 158 Kms of low voltage lines



Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Unit Price
Construction Period	2007 - 2009
Cost	€ 9 439 006,00

* Job in Consortium





Transmission and Distribution Works



Electricity III Package 1 and Package 2

Gaza, Inhambane, Nampula – Mozambique

Description of Works

Electricity III- Package 1 and 2, Supply and Erection Medium and Low Electricity Networks in Mozambique is the name of the contract that EDM- Electricity of Mozambique has awarded to Seth, through financing guaranteed by the African Development Bank and the Fund for International Development.

This contract had an execution period of 18 months and involved the construction of about 700 kilometers of medium and low voltage power distribution lines in various neighborhoods in Inhambane and Nampula provinces, as well as their final connection until around 8 thousand final consumers.



Package 1- Power supply to Gaza and Inhambane Provinces:

- Supply and assembly of about 228 km of airlines, 33 kV
- Supply and assembly of about 154 km of airlines, 0.4 / 0.23 kV
- Supply and assembly of about 67 air transformers, 33/0.4 kV
- Final link to about 4,500 consumers

Package 2: Power supply to Nampula Province including:

- Supply and assembly of about 247 km of airlines, 33 kV
- Supply and assembly of about 63 km of airlines, 0.4 / 0.23 kV
- Supply and assembly of about 22 air transformers, 33 / 0.4 kV
- Final link to about 3,400 consumers



Main quantities

- Connection of 8000 end consumers
- 89 units of 33/0.4 kV transformers
- 575 Kms of medium voltage lines
- 217 Kms of low voltage lines

Work Summary

Client	EDM – Electricidade de Moçambique
Contract Type	Turnkey
Construction Period	2010 - 2012
Cost	€ 17 410 358,00



Transmission and Distribution Works

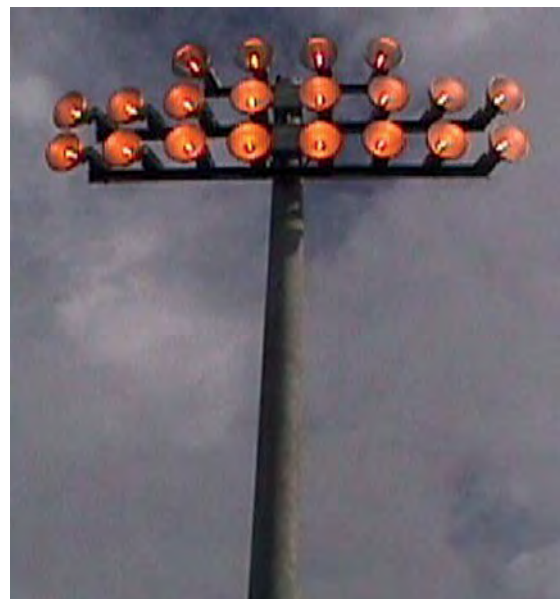
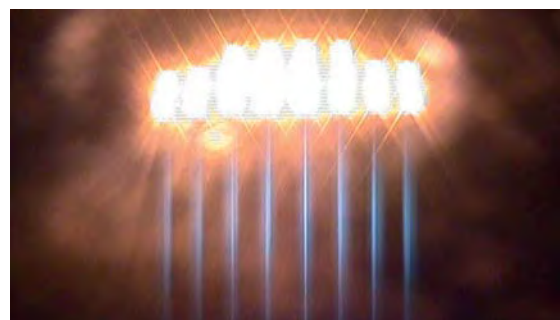


Apron Security Lighting

United States Navy, Lajes Field, Azores (Portugal)

Scope of Work

- Trenching and cabling installation.
- Installation of 26 multi-fixture (20) lighting posts (20 m).
- Buried MV cable (15 kV) for post feeding.
- Installation of step-down transformers at each post location.
- Operational testing and commissioning of the installation.



Work Summary

Client	U.S. Navy
Contract Type	Turn-Key
Construction Period	2000 - 2001
Cost	USD 1,44 million





Building and Industrial Construction



Improvement of Industrial Storage

Parque Industrial e Logístico SAPEC Bay / Setúbal
(Portugal)

Work Description

SAPEC QUÍMICA awarded to Seth the requalification works of the industrial unit located in the Sapec bay Industrial and Logistic Park, specifically in the execution of the demolition works of the storage area of the existing building with approximately 1,901.37 m² of construction area and for its replacement, in the construction of a building with an area of 2,240.00 m² designated by a 70x32 spacecraft, also destined to the use of storage, in the construction of technical gallery under the new warehouse and supply of installation of crossings and set of tubes , support infrastructures and external pavements.

The contract also included the elaboration of the following projects of the specialties:

- Stability project;
- Project fire safety in buildings;
- Electricity and communications project;
- Project of pavements in concrete and bituminous, which also contemplates the exterior of the work area;
- Projects of water and domestic effluents;
- Project of requalification of the network and containment of treated rainwater and industrial waters and control of spills;
- Gas, thermal and acoustic projects.



Work Summary

Client	SAPEC QUÍMICA, SA
Contract Type	Lump Sum
Construction Period	2018 - 2019
Cost	€ 1 368 299,98



Building and Industrial Construction



Industrial Storage

Parque Industrial SAPEC Bay / Setúbal (Portugal)

Work Description

SAPEC AGRO awarded to Seth the construction of the new Warehouse S2/S3 inside the industrial park SAPEC BAY (Setubal), in order to ensure the increase in storage capacity of finished products are manufactured in SAPEC

AGRO.

With a 4,100 m2 area of deployment this warehouse has been designed and implemented to work with four distinct storage areas ("cantons") and separated by firewalls, connected by a central corridor. The minimum right foot is 10 m in all storage spaces. Even within the covered warehouse area was performed a technical area offices with two floors with a total area of 250 m2.

The Warehouse S2/S3 was built in less than seven months, and included the following work:

- Demolition of existing single floor slab, 4,300 m2;
- General excavation for platform preparation, 6,000 m3;
- Existing retaining wall replacement, 70 ml;
- Implementation of direct foundations/in-situ shoes, 450 m3;
- Prefabrication and installation of concrete elements: pillars (70 pcs), prefabricated panels (4,000 m2) and beams (24 m long);
- Panel type "sandwich" mounting in rock wool on the roof and on the facade;
- Execution of armed storey slabs with surface hardener-4,000 m2;
- Implementation of infrastructure electricity and telecommunications;
- Installation of 18 outflow points in the coverage.



Work Summary

Client	SAPEC-AGRO, SA
Contract Type	Lump Sum
Construction Period	2015 - 2016
Cost	€ 1 840 000,00

Main quantities

- 10.000 m2 of reinforced concrete floor;
- 170 tons of metal structures;
- 1.000 m3 of concrete foundations and various structures.



Building and Industrial Construction



Renovate Building T-715 for Civil Engineering (CE) Consolidation Efficiency

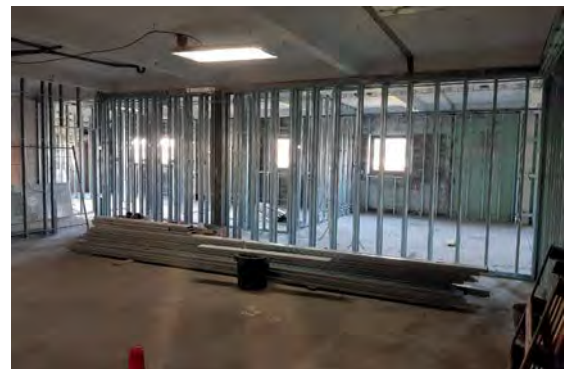
Lajes Field, Terceira Island, Azores (Portugal)

Work Description

Existing building renovation in Lajes Field, Azore (Portugal), to accommodate United States Air Force (USAF) Civil Engineering Squadron (CES).

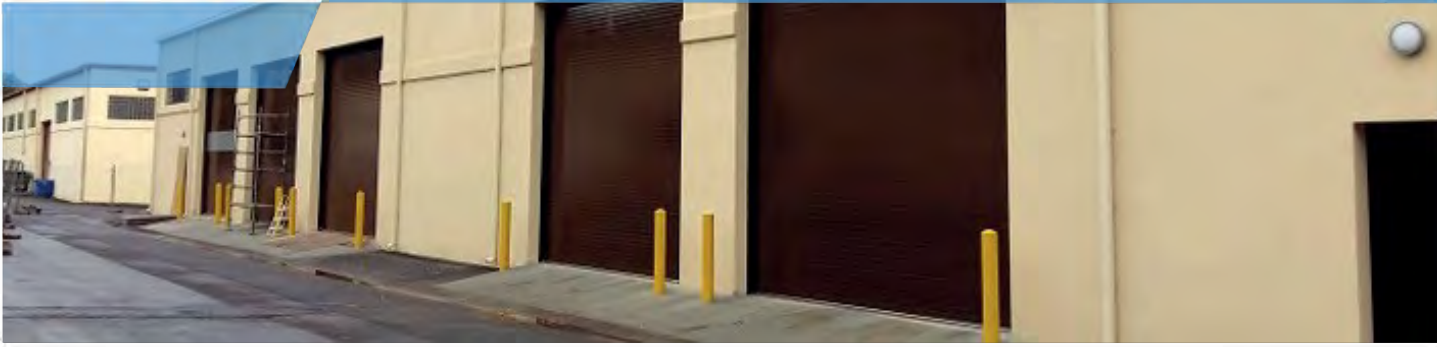
The work includes

- Selective demolition including Asbestos and Lead based Paint abatement and disposal;
- Reconfiguration of programmatic spaces which consist mostly of offices, conference rooms, storage, bathrooms, and utilities shop space;
- New roof system installation (LSF structure and roof panels);
- Exterior wall repairs and painting;
- Finish upgrades including partitions, pavements, ceilings and doors;
- Elevator installation;
- HVAC system and Direct Digital Control installation;
- Interior water distribution installation and water main connection;
- Sewer system installation (interior and connections to main);
- Electrical System installation/conversion to European standards including: Transformer; Electrical Panels; Cable Trays; Cables-Accessories; Luminaires; Lightning Protection System; Grounding; Generator Set installation; New Communication System (cable tray, cables, accessories and racks); Fire alarm and Sprinkler system installation.



Work Summary

Client	USAF – United States Air Force
Contract Type	Lump Sum
Construction Period	2021 - 2022
Cost	€ 3 608 867,04



Building and Industrial Construction



Convert T-611 to LRS Vehicle Maintenance

Lages Field, Terceira Island, Azores (Portugal)

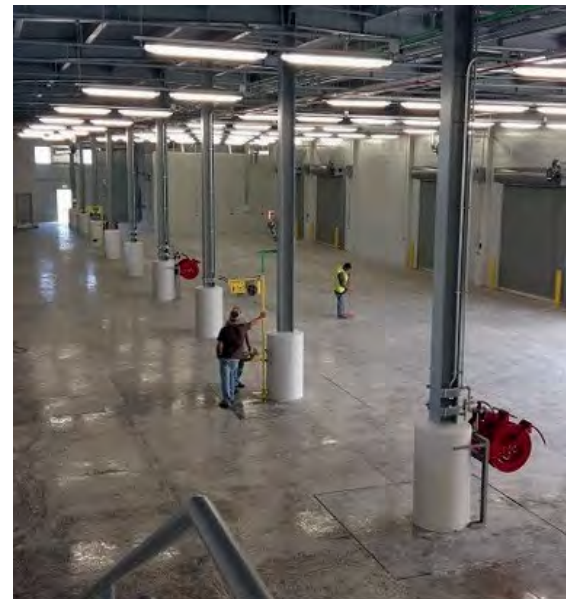
Job description

The 65th Contracting Flight (USAF) granted for Seth the work contract to Convert T-611 to LRS Vehicle Maintenance at Lages Field, Azores, Portugal.

Renovation of the existing T-611 building was promoted to convert the facility from a warehouse into a vehicle maintenance shop.

The scope of work includes

- Selective demolition of significant portions of the existing warehouse building and constructing new cast-in-place concrete walls and steel roof structure.
- Alterations to site utilities, architectural, structural, plumbing, HVAC, fire protection, fire alarm, and electrical systems will be required as described in drawings and specifications.
- Work also includes all incidental and related tasks necessary to provide a complete and usable facility for its intended purpose.



Work Summary

Client	USAF – United States Air Force
Contract Type	Lump Sum
Construction Period	2014 - 2016
Cost	€ 1 579 124,62





Building and Industrial Construction



Sines LPG Bottle Filing Plant Sines Refinery of Galp, SA

Sines (Portugal)

Work Description

Seth, SA, carried out all the civil construction work for the Gas Bottle Filling Plant undertaken at the Sines Refinery of Galp, SA, where its customer was Galp Gás, SA.

Of the work undertaken, we would underscore the filling building, the office building (including electricity, water and drains networks), the porters buildings (including the electricity network), the fork-lift truck garage, the steel pipe rack to support the pipework over the railway line, the compressed-air and pumping equipment foundations, the entire water and drains networks, as well as connecting up with the Existing networks, the electrical and instrumentation networks, 10,000 m2 of concrete flooring for the full and empty bottle store, as well as full support to all the civil construction work in respect of the installation of the booster pumps using to supply the gas to the new facility.



Main quantities

- 10,000 m2 reinforced concrete paving;
- 170 tonnes of steel structures;
- 1.000 m3 of concrete for foundations and sundry structures.

Work Summary

Client	TECHNIP PORTUGAL, SA
Contract Type	Lump Sum
Construction Period	2004 - 2005
Cost	€ 2 000 000,00



Building and Industrial Construction



Dyrup - Warehouse for Finished Products

Sacavém (Portugal)

Work Description

Construction of a prefabricated metal building.

- Dimensions : 70 x 51 m
- Free span: 54m
- Concrete: 4100 m³
- Exterior pavements : 4 500 m²
- Earth fill: 17 500 m³
- Warehouse ground slab sized for 100 kN concentrated live load.

Main features

- Mezzanine for office space (70 x 10 m).
- 10 loading/unloading docks with hydraulic platforms and electrical system
- Full thermal insulation
- Landscaping

Structural design: Planegé

Mechanical/Electrical: Planegé



Work Summary

Client	Tintas Dyrup, SA
Contract Type	Lump Sum
Construction Period	1997 - 1998
Cost	PTE: 446 400 000





Building and Industrial Construction



Rainha Sta. Isabel Secondary School Severim de Faria Secondary School

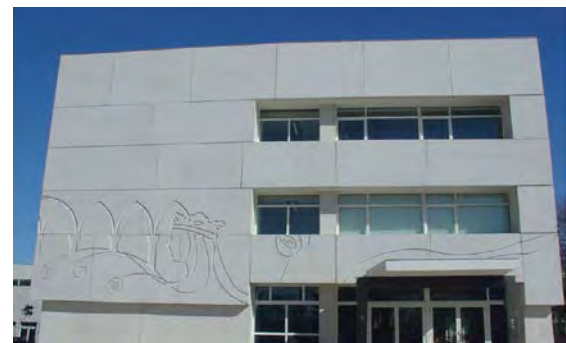
Estremoz / Évora (Portugal)

Job Description

Seth (in consortium with two other companies) has carried out rehabilitation work at the Rainha Sta. Isabel Secondary School (in Estremoz) and at the Severim de Faria Secondary School (in Évora).

These jobs, included in "Stage 2A of the Secondary Schools Modernisation Programme- Let 2AS3" in respect of the schools of Évora and Estremoz, were awarded to the consortium for the sum of 22,680,401.33 euros.

The works included remodelling, modernisation and (in some cases) enlargement of the schools, the idea being to rehabilitate and modernise the buildings and to re-establish their physical and functional efficacy, from a standpoint of creating conditions to provide modern education suited to the programme contents, the didactic contents and the new information and communication technologies.



Rainha Sta. Isabel Secondary School

Location: Estremoz

Planned capacity: 39 classes

Architecture / Project Co-ordination: José Laranjeira

Completion deadline: 15 months

Cost: EUR 12,207,000.00

Severim de Faria Secondary School

Location: Évora

Planned capacity: 36 classes

Architecture / Project Co-ordination: FSSMGN Arquitectos, Lda (Fernando Sanches Salvador and Margarida Grácio Nunes)

Completion deadline: 15 months

Cost: EUR 10,980,000.00

Work Summary

Client	Parque Escolar, EPE (Entidade Pública Empresarial)
Contract Type	Lump Sum
Construction Period	2009 - 2010
Cost	€ 23 187 000,00



Building and Industrial Construction



Secondary School Modernisation Programme at Pontinha

Pontinha (Portugal)

Description of works

Seth (in consortium with two other companies) carried out the modernization work of Freire Bramcamp Secondary School, located at Rua Dr. Gama Barros, Pontinha, Amadora.

These works, integrated into the process of "modernization for phase 3A of the Schools Modernisation program with Secondary Education- Lot 3 L1 EI" were awarded to the consortium by the value of 12,476,478.86 euros.

The works comprised the refurbishment, modernization and expansion of that school, in order to rehabilitate and modernize the buildings, restoring the physical and functional effectiveness, with a view to creating conditions for the practice of a modern education, adapted to the syllabus, to teaching and new technologies of information and communication.



Work Summary

Client	Parque Escolar, EPE (Entidade Pública Empresarial)
Contract Type	Lump Sum
Construction Period	2011 - 2012
Cost	€ 12 476 478,00





Building and Industrial Construction



Secondary School Modernisation Programme at Bragança

(Portugal)

Description of works

Seth (in consortium with two other companies) carried out the modernization work Emídio Garcia Middle School, located at Rua Eng. Adelino Amaro da Costa, the city of Bragança.

These works, integrated into the process of "modernization for phase 3A of the Schools Modernisation program with Secondary Education- Lot 3EN10" awarded to the consortium by the value of 12,950,871.18 euros.

The works comprised the refurbishment, modernization and expansion of these schools, in order to rehabilitate and modernize the buildings, restoring the physical and functional effectiveness, with a view to creating conditions for the practice of a modern education, adapted to the syllabus, to teaching and new technologies of information and communication.



Work Summary

Client	Parque Escolar, EPE (Entidade Pública Empresarial)
Contract Type	Lump Sum
Construction Period	2011 - 2012
Cost	€ 12 950 871,18



Building and Industrial Construction



5 Star Touristic Luxury Apartments

Reserve – Quinta do Lago (Almancil, Loulé, Algarve (Portugal))

Work Description

Seth executed (in Consortium) a five-star tourist resort, called "Reserve", consisting of twenty-six (26) tourist apartments, residents' club and respective exterior arrangements, on a 14.000 square meters plot of land located in Quinta do Lago, municipality of Loulé (Algarve, Portugal).

The five-star luxurious touristic resort is conveniently located, with easy access to all major freeways, comprises luxury villas with garden and penthouses, private parking, individual swimming pools and private elevators.

This tourist village has its own Residents' Club and respective gardens and external works, restaurant, bar, private playground and sports fields.



Work Summary

Client	Quinta Reserva - Empreendimentos Imobiliários e Turísticos, SA
Contract Type	Lump Sum
Construction Period	2017 - 2018
Cost	€ 23 500 000,00



Building and Industrial Construction



Corporate Headquarters

Queijas, Oeiras (Portugal)

Work description

The main goal in the design of the new headquarters underwent achieve harmonize three fundamental aspects: aesthetics, functionality and energy efficiency.

The main dimensions of the building are the following:

- Deployment area - 1334m²
- Construction area above ground - 1583m²
- Building area buried - 1289m²
- Sealed area - 1725m²
- Cércea maximum - 10.93 m

The building consists of 4 floors. The floor-2 intended to parking with 30 places, has 4 rooms and equipment storage pumping rainwater and sewage.

At floor-1 are given various types of usage: Living surveillance, parking for 20 cars, storage, gym, locker rooms, cafeteria, kitchen, boiler room, and the Medical Centre. On the floors above ground and the offices are situated on the top floor are located the air handling equipment, air conditioning and building solar panels and photovoltaic.

The interior areas of the floors are:

- Floor -2 -1289m²
- Floor -1 -1289m²
- Level 0 - 858m² 1st Floor - 642m²

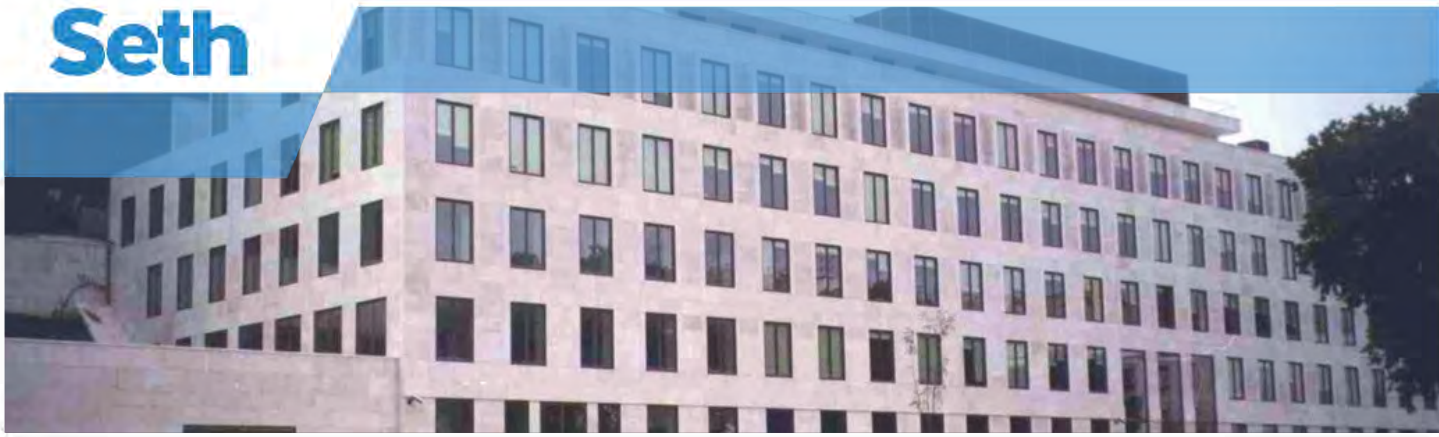
Think about a high efficiency over the life of the building, installed the following materials and equipment: automatic climate control and lighting inside the building; lights low power, installation of shade visors; glazing solar in south facades and exterior walls consist of two panels of masonry, air-box and "Wallmate", thus enabling to obtain low heat transfer coefficients.

In order to reduce the consumption of mains water, installed a system of rainwater harvesting, which after treatment are used in the discharges of toilets, taps of service garages (washing floors) and outside building, for watering the gardens.



Work Summary

Client	Seth, SA
Contract Type	Lump Sum
Construction Period	2008 - 2009
Cost	€ 3 450 000,00



Building and Industrial Construction



Parliament Building Addition

2nd Phase – Finishes

Lisbon (Portugal)

Work description

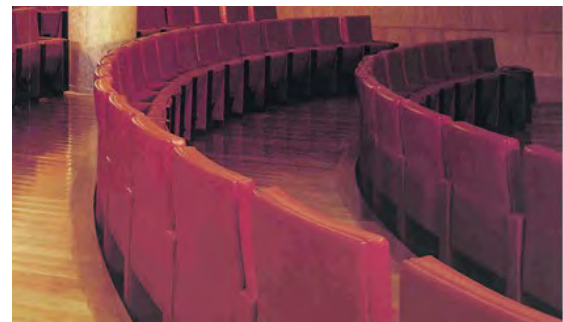
Main figures:

- 9 levels
- 170 offices and meeting rooms
- Auditorium and restaurant
- 155,000 sq.ft of marble cladding
- Installation
- 6 elevators
- General Finishing Work Contract (level -3 until level 6)
- Marble cladding on the exterior walls
- Interior wall finishes with marble cladding; solid oak door frames and doors
- Double-glazing windows with solid brass frame

Inspection agency: Cinclus, SA

Mechanical & Electrical : Eng. Rodrigues Gomes & Associados

Architect: Fernando Távora (Professor Oporto University)



Work Summary

Client	Assembleia da República Portuguesa
Contract Type	Lump Sum
Construction Period	1998 - 1999
Cost	PTE: 2.300.000.000





Concrete and Special Formwork



Water tank with 7,5000 m³ capacity, in reinforced concrete

Alto de Santa Catarina, Linda-a-Velha, Oeiras (Portugal)

Description of Work

Construction of a new tank in reinforced concrete, consisting of two cells of 5,000 m³ each, next to the existing Final Reservoir of the Western Adductor.

It is a reservoir made up of two square-shaped cells with a unit capacity of 5000 m³ to store drinking water.

The main works in this endeavor are as follows:

- Earthmoving works with emphasis on rock excavation;
- Construction works in reinforced concrete;
- Supply and installation of carbon steel pipes and electromechanical equipment;
- Supply, assembly in cast iron piping (FFD) in ditch;
- Execution of rainwater drainage;
- Execution of connections to existing hydraulic circuits;
- Electrical, instrumentation and safety installations;
- Installation of a telemanagement system;
- Exterior arrangements.

The contract included the supply and assembly of all associated electromechanical equipment.



Main quantities

Excavation: 4.500 m³

Structural fill of the cell foundation, switching chamber and access road 10,000 m³

Landscaping of the enclosure perimeter 11,500 m³

Cyclopean concrete to reinforce the cell foundation and maneuvering chamber 2500 m³

Structural Concrete C35/45 XC4 e C40/50 XA2 1800 m³

Cleaning concrete for leveling foundations 200 m³

Concrete reinforcement 240.000 kg

Formwork 6000 m²

Interior waterproofing of the entire Reservoir (2 cells) 5000 m²

Work Summary

Client	SIMAS Oeiras e Amadora
Contract Type	Lump Sum
Construction Period	2021 - 2023
Cost	€ 2 048 910,91



Concrete and Special Formwork



Water tank with 5,000 m³ capacity, in reinforced concrete

Alto do Cotão, Cacém (Portugal)

Description of Works

Seth was awarded the contract for the construction of the 3rd cell of 5,000 m³ of the “Alto do Cotão” reservoir, in the parish of Cacém, municipality of Sintra.

With an execution period of 7 months (210 days), the works involved the execution of surveys, general earthworks, reinforced concrete structures, pipes and accessories.

The solution found for the reservoir was the construction of a prefabricated reservoir measuring 55 m long by 17 m wide, in order to take advantage of the available area for implementation.

The location and type of land required the sanitation of the foundations and the execution of cyclopean concrete to guarantee the threshold level of the deposit.

Various drainage works, exterior repairs and paving were carried out.

The works also include the connection to the supply and distribution ducts, as well as all the accessories and valve of the control box.

Main Quantities

- Excavation: 5.400 m³
- Landfill: 1.500m³
- Structural Concrete C40/50: 400 m³
- Cyclopic Concrete C16/20: 650 m³
- Construction Armor: 50.000 Kg
- Pre-fabricated Reservoir: 5000 m³

Work Summary

Client	Marfer / Univ Católica / Montepio
Contract Type	Lump Sum
Construction Period	2021 – 2022
Cost	€ 1 019 265,05





Concrete and Special Formwork



New Barlavento Water Tank Reserve at Northwest Faro

Espargal, S. Sebastião, Lagos (Portugal)

Description of Work

Construction of a new water tank in reinforced concrete, consisting of two square-shaped cells with a unit capacity of 5,000 m³ each one, next to the existing Final Reservoir of the Western Adductor.

The main works in this endeavor are as follows:

- Earthmoving works with emphasis on rock excavation;
- Construction works in reinforced concrete;
- Supply and installation of carbon steel pipes and electromechanical equipment;
- Supply, assembly in cast iron piping (FFD) in ditch;
- Execution of rainwater drainage;
- Execution of connections to existing hydraulic circuits;
- Electrical, instrumentation and safety installations;
- Installation of a tele-management system;
- Exterior arrangements.

The contract included the supply and assembly of all associated electromechanical equipment.

Main quantities

- General Excavation – 13.640 m³
- Concrete type C30/37 – 3.135,00 m³
- Total weight of steel – 377 ton
- Total formwork area – 9.450 m²



Work Summary

Client	Águas do Algarve, SA
Contract Type	Lump Sum
Construction Period	2020 - 2022
Cost	€ 2 565 000,00



Concrete and Special Formwork



Civil Works for Desulphurization Plant, at the Thermoelectric Power Plant, Sines EDP Sines (Portugal)

Work Carried Out

The desulphurisation project for the Sines Thermoelectric Power Station consists of implementation of four limestone/gypsum wet flue gas desulphurisation (wet FGD) units, one for each of the respective electricity generators. The desulphurisation process basically consists of removal of the SO₂ from the combustion gases through reaction with an alkaline absorbent, obtaining gypsum as a sub-product.

The main components of the desulphurisation system are indicated hereunder, complete with the associated civils:

- Combustion Gas System: construction of ventilator foundations and reinforced-concrete pipeline supports.
- SO₂ Absorption System: foundations of the absorbers, pumping wells, sundry foundations for equipment.
- Limestone Storage System: very large foundation for two steel limestone tanks, three foundations for ball mills, well to house the limestone unloading system and conveyor belt for transport to the tanks, all the surrounding building and foundations for various items of equipment.
- Gypsum Storage System: construction of a reinforced-concrete silo, diameter Ø24 m, height 40 m, capacity 9,000 m³.
- Desulphurisation Liquid Effluent Treatment System: construction of 2 decantation tanks, 10 square tanks, sludge building, electrical building and sundry retention basins.
- Ancillary Energy Systems: building for an ancillary boiler and sundry basins. Electrical and Central Command Building: construction of a building with basement to house the electrical switchboards, laboratory, command and control room, etc.
- Compressed Air Systems: construction to four buildings next to the generators to provide compressed air to the desulphurisation system. To support the sundry pipework a Pipe Rack was build from the 4 units to what is known as the common zone.

Ancillary work included sundry drainage, landscaping and paving.



Work Summary

Client	Consórcio Hitachi - Coba
Contract Type	Lump Sum
Construction Period	2005 - 2008
Cost	€ 14 000 000,00

Major Quantities

- Excavation: 160.000 m³
- Landfill: 95.000m³
- Structural concrete C35/45: 25.000m³
- Lean concrete C12/15: 8.500m³
- Formwork: 48.000m²
- Construction rebar: 2.600.000kg
- Sundry steel elements: 400.000 kg



Geotechnical Engineering



PVC Sheet-piling curtain

Cais da Moita, Moita (Portugal)

Work description

SETH first executed a 4 m long PVC plank pile curtain over a length of thirty (30) metres. PVC plank cuttings are resistant, durable and watertight, maintenance-free, highly resistant to corrosion and the impact of atmospheric and biological factors, including UV radiation and seawater. Resistant to mechanical damage, including scratches, cracks and abrasions, 100% recyclable with the advantage of not changing the quality of water or ground in contact.

They are ideal for carrying out work in rivers or at sea and in protected environmental areas, thanks to their flexibility and long service life, without maintenance and with excellent aesthetic and environmental performance.



Work Summary

Client	UrbeHydraulic, Lda. (License 68029)
Contract Type	Lump Sum
Construction Period	2022
Cost	€ 39 392,00



Geotechnical Engineering

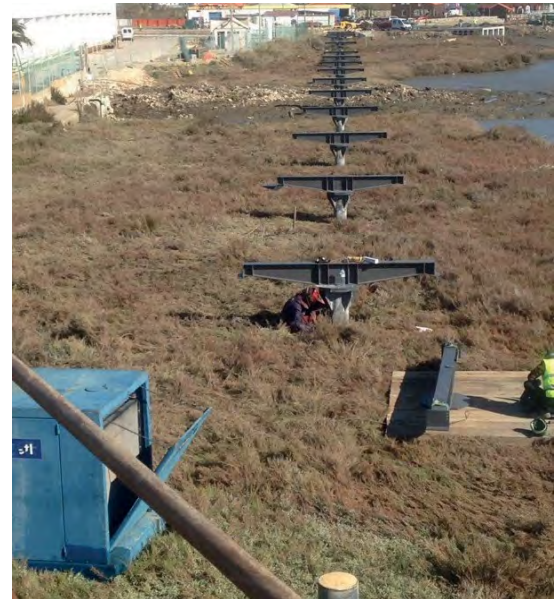


Moinhos da Póvoa River Park and Tagus Bicycle Path

Póvoa de Santa Iria Water Front, Vila Franca de Xira (Portugal)

Description of the work

As part of the work called "Parque Ribeirinho Moinhos da Póvoa e Ciclovía do Tejo" by a general contractor, Seth was awarded the works of 39 tubular piles with 355 mm diameter (12.5 mm thick) with an average length of 36 m that served as support to the footbridge.



Work Summary

Client	Luís Frazão, SA
Contract Type	Lump Sum
Construction Period	2018
Cost	€ 285 000,00





Geotechnical Engineering



Sheetpiling and Precast Piles OGMA (Embraer Group), Alverca (Portugal)

Work Description

The piles are driven with modern, free-fall equipment, using a hammer of between 5 and 9 tons raised either by a simple cable system, or the most advanced high performance hydraulic drive methods. This equipment is completely autonomous (requiring no auxiliary components) and mounted on crawler-cranes for easy movement.



Work Summary

Client	Armando Cunha, SA
Contract Type	Lump Sum
Construction Period	2019
Cost	€ 118 770,00





Geotechnical Engineering



Pre-cast Piles

Samora Correia, Benavente (Portugal)

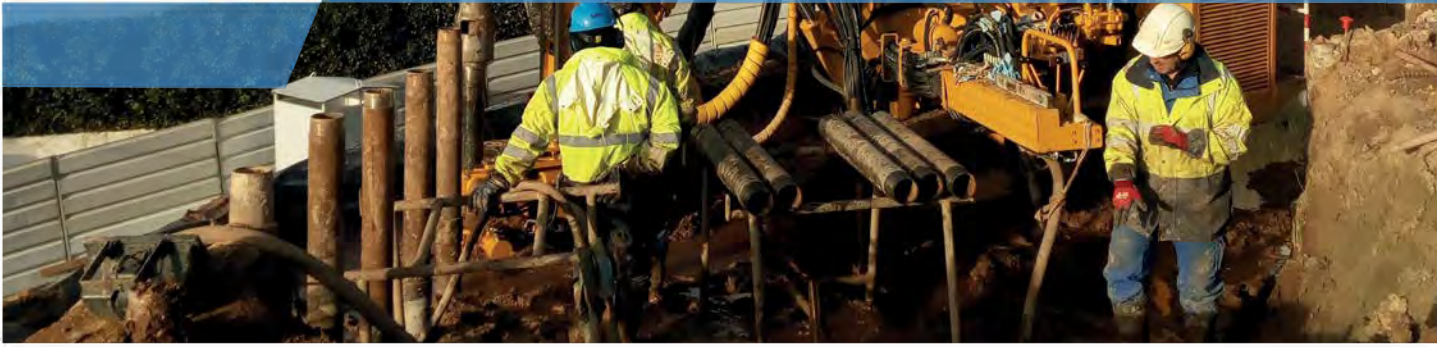
Work Description

The piles are driven with modern, free-fall equipment, using a hammer of between 5 and 9 tons raised either by a simple cable system, or the most advanced high performance hydraulic drive methods. This equipment is completely autonomous (requiring no auxiliary components) and mounted on crawler-cranes for easy movement.



Work Summary

Client	Manuel Joaquim Caldeira, Lda
Contract Type	Lump Sum
Construction Period	2019
Cost	€ 49 848,00



Geotechnical Engineering



Micro-Piles, Foz do Arelho

Foz do Arelho, Caldas da Rainha (Portugal)

Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology.

They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.



Work Summary

Client	Construções Linto & Marques, Lda.
Contract Type	Lump Sum
Construction Period	2019
Cost	€ 66 598,00



Geotechnical Engineering



Micro Piles, Lallemand

Lallemand Factory at Setúbal (Portugal)

Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology.

They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.

Supply

- 21 micropiles with N80 reinforcement $\varnothing 114.3 \times 9.0$ mm.



Work Summary

Client	Reflexos do Tejo
Contract Type	Unit Price
Construction Period	2018
Cost	€ 35 155,20



Geotechnical Engineering



Micro Piles, SCC

SCC, Vialonga, Vila Franca de Xira (Portugal)

Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology.

They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.

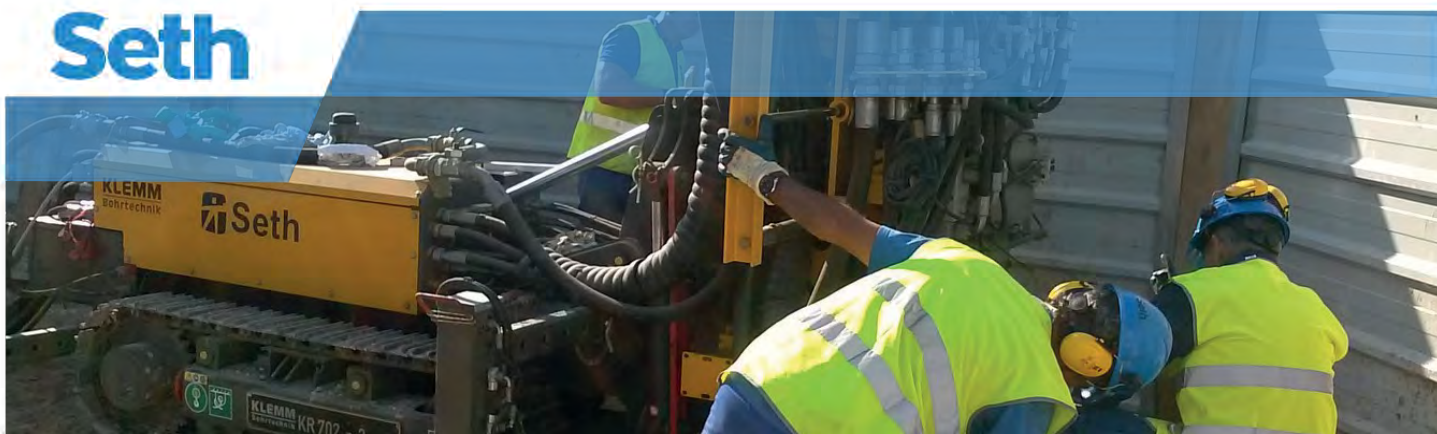
Quantity supplied

- 72 micropiles with N80 reinforcement Ø114.3x10.0 mm.



Work Summary

Client	Graviner Construções, SA
Contract Type	Unit Price
Construction Period	2018
Cost	€ 71 410,40



Geotechnical Engineering



Micro Piles, “Coches” Museum

Lisbon (Portugal)

Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology. They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.

Quantities executed

- 14 micropiles with N80 reinforcement, Ø114.3 x 9.0 mm, for pedestrian bridge foundation.
- 19 micropiles with N80 reinforcement, Ø127.0 x 9.0 mm, for Esplanada foundation.
- 14 HEB120 profiles for Berlin-type containment.

For the execution of micropiles, Seth uses versatile and compact equipment, namely the Klemm 702 and Klemm 803 machines.



Work Summary

Client	Consórcio: João Fernandes da Silva, S.A. + Construções Refoiense, Lda
Contract Type	Unit Price
Construction Period	2017
Cost	€ 60 697,50



Geotechnical Engineering

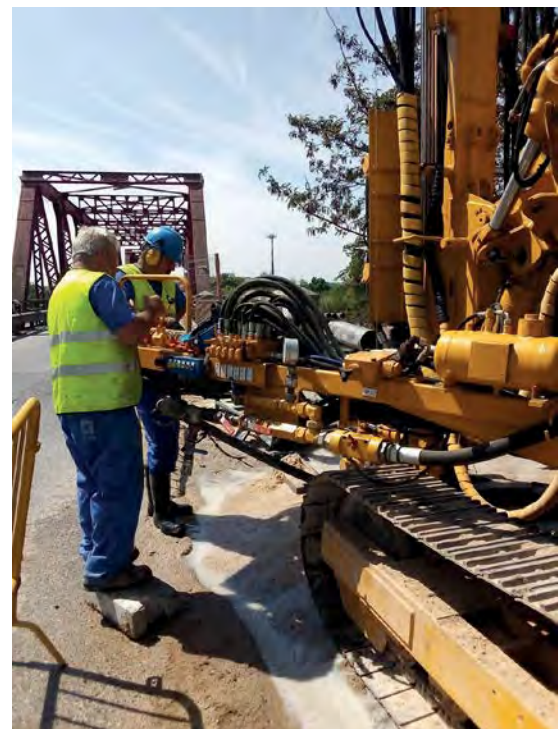


Sheetpiling and Precast Piles

25 April Garden, Coruche, Santarém (Portugal)

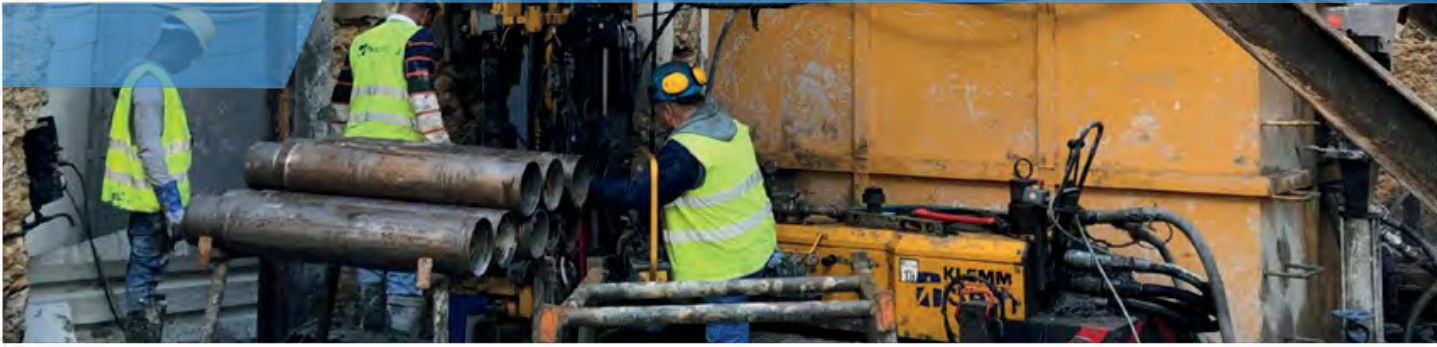
Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology. They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.



Work Summary

Client	Somague, SA
Contract Type	Lump Sum
Construction Period	2019
Cost	€ 289 484,80



Geotechnical Engineering



Precast Piles

Lisbon (Portugal)

Work Description

Micro piles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology. They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.

Main quantities executed

- 4 micropiles with N80 reinforcement Ø60.3 x 5.5 mm for span support
- 18 micropiles with N80 reinforcement Ø139.7 x 12.50 mm for portals
- 48 micropiles with N80 reinforcement Ø139.7 x 9.0 mm for portals and facade retention.
- 106 micropiles with N80 reinforcement, Ø139.7 x 9.0 mm, for the foundation of the new section to be built.



Work Summary

Client	Sacyr Somague, SA
Contract Type	Unit Price
Construction Period	2019 - 2020
Cost	€ 324 809,20



Geotechnical Engineering



Micro-Piles, EDP Substation

Lisbon, Portugal

Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology. They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.



Work Summary

Client	Graviner, SA
Contract Type	Unit Price
Construction Period	2017
Cost	€ 118 138,40



Geotechnical Engineering



Precast Piles

Soporcel Factory, Figueira da Foz (Portugal)

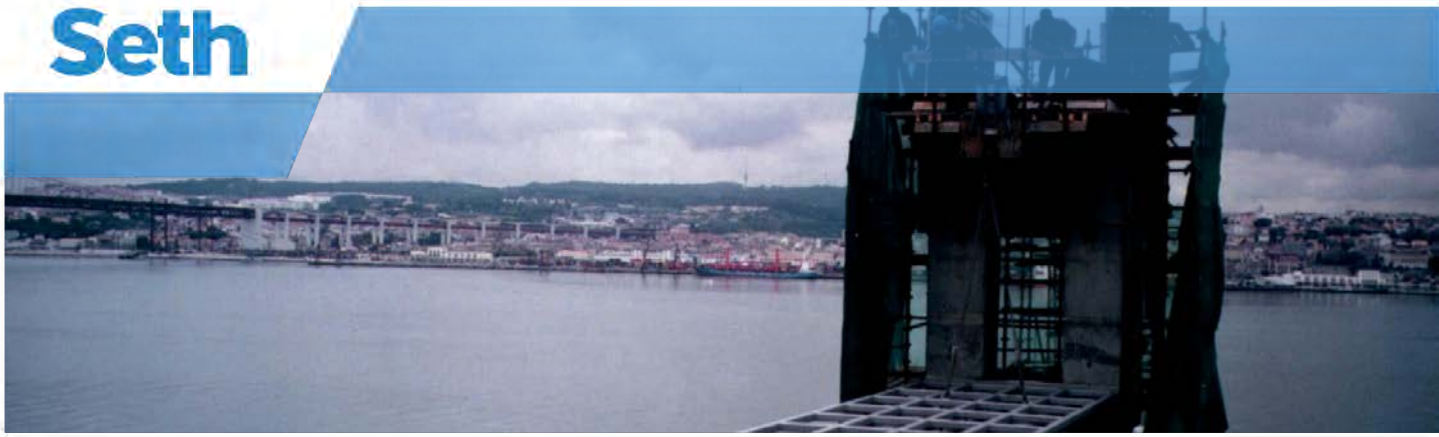
Work Description

Micropiles are generally used when there are difficult ground conditions, such as natural or man-made obstructions, sensitive ground with adjacent structures, limited access/low headroom and/or karstic geology. They are commonly used to replace deteriorating foundation systems, for the renovation of structures, to support structures affected by adjacent construction, for seismic retrofitting or in-situ reinforcement including embankment, slope and landslide stabilization.



Work Summary

Client	Grupo AOC
Contract Type	Unit Price
Construction Period	2019 - 2020
Cost	€ 35 530,00



Design-Build



Panoramic Elevator at Boca do Vento

Almada, Setúbal (Portugal)

Work Description

Design-Build of a panoramic elevator, with exterior cabin
Tower Height: 50 m

Foundations

In bored cast-in-place piles
Quantity: 15
Length/diameter of piles: 15 m / 800 mm

Formwork Type

Climbing formwork

Steel Structures

42 ton

Elevator

- Course: 42 m
- Capacity: 1600 kg / 21 people
- Stainless steel outdoor cabin

Conceptual design: José Aurélio (*Sculptor*)
Project by the Architects: Fidalgo Mineiro; Helena Moreira
e Anabela Felícia.

Structural design: Alfredo Pinho Morgado (*Civ.Eng.*), Luís Morgado (*Civ.Eng.*)



Work Summary

Client	C.M. Almada
Contract Type	Design-Build
Construction Period	1998 - 1999
Cost	PTE 152.000.000





Design-Build



Pedestrian Bridge

Alcácer do Sal, Setúbal (Portugal)

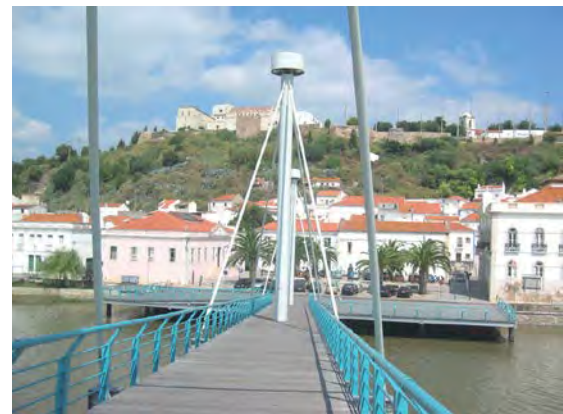
Cable-stayed bridge Dimensional features

Length: 121 m
Deck width: 3,5 m
Maximum span between pylons: 27 m Maximum height above water: 6 m
Pylons: driven tubular piles (Ø 708 and 508 mm)

Construction features

Steel piles: 110 t
Steel deck and abutments: 169 t
Reinforced concrete: 62 m³
Exotic wood on deck: 1300 m²

Design-Build: Luís Colen (Civ. Eng.)



Work Summary

Client	C.M. Alcácer do Sal
Contract Type	Lump sum
Construction Period	2001
Cost	€ 1 855 000,00





Design-Build



Dismantling of Facilities Portucel Recycler

Mourão, Évora (Portugal)

Work Description

Dismantling and demolition of the whole of the built heritage that was a former Portucel's manufacturing unit recycles (floors, foundations, structures of concrete and metal, buildings, storage tanks, deposits, equipment, pipelines, dams, curbs and walls, lighting poles and seals).

In the southern half of the former factory were removed as sludge, such as land mixed with sludge and other waste found there and was completed its modeling to ground.

In the area of plant and this north beyond the built heritage, and the sequence of removal of existing waste there, were removed as interface lands.

The area affected by this contract- such as quotas from 120 m to 136 m, only a small area- nodes preparation zone- are about on the height of 140 m, with aprox 0.5 ha.



Work Summary

Client	EDIA — Empresa de Desenvolvimento e Infra-Estruturas do Alqueva, SA
Contract Type	Lump Sum
Construction Period	2001
Cost	€ 18 605 253,20





WWTP, WTP and Marine Outfall



Marine Outfall – WWTP Ribeira dos Moinhos

Sines – Santiago do Cacém (Portugal)

Work description

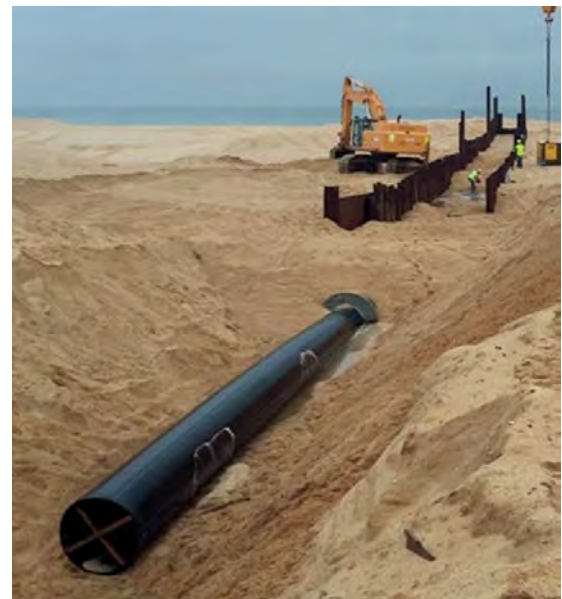
The public company Águas de Santo André has awarded to Seth the contract for repair the Outfall of the mill Ribeira WWTP that covering the municipalities of Sines and Santiago do Cacém.

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





WWTP, WTP and Marine Outfall



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



WWTP, WTP and Marine Outfall

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



WWTP, WTP and Marine Outfall



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





WWTP, WTP and Marine Outfall



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 Ramalhe 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





WWTP, WTP and Marine Outfall



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





WWTP, WTP and Marine Outfall



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

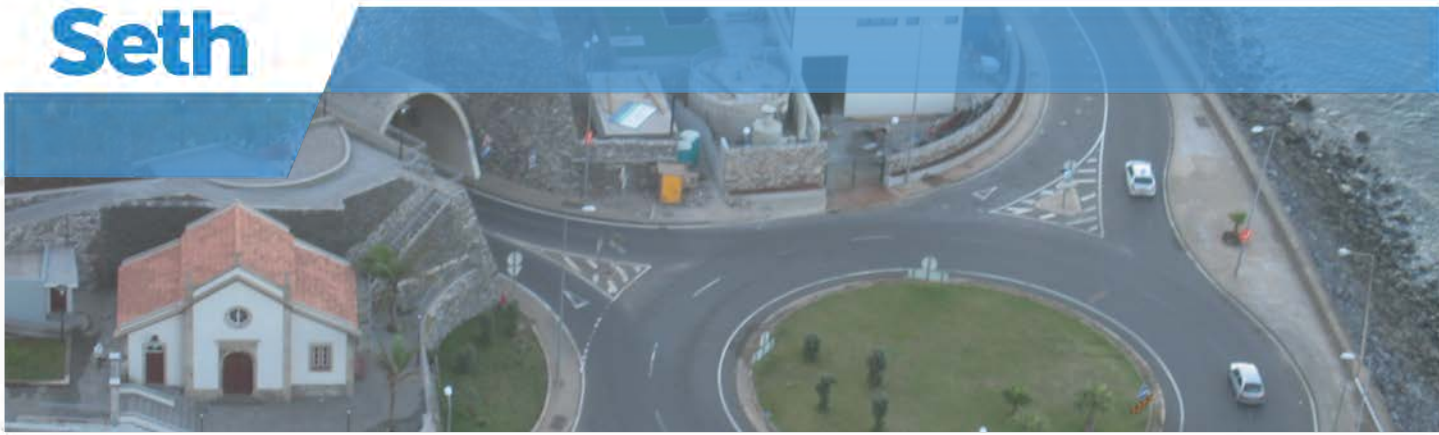
(gravity thickening of excess biological sludge and centrifuge dehydration).



Work Summary

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





WWTP, WTP and Marine Outfall



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





WWTP, WTP and Marine Outfall



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



WWTP, WTP and Marine Outfall



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





WWTP, WTP and Marine Outfall



Wastewater Treatment Plant

PORTUCEL SOPORCEL Group

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

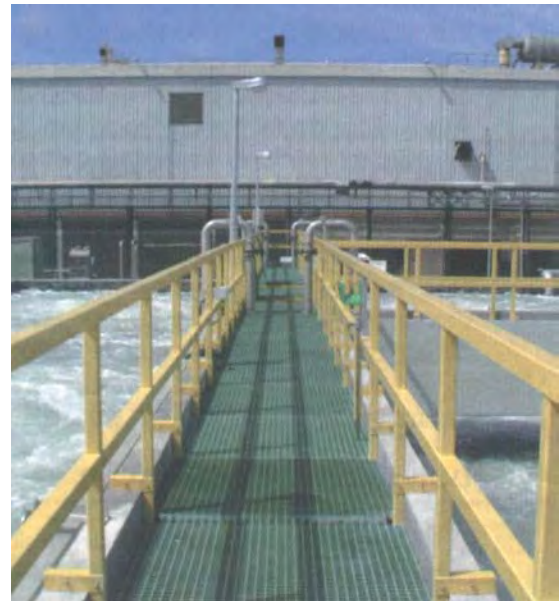
Main features

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





WWTP, WTP and Marine Outfall



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





WWTP, WTP and Marine Outfall



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



Gas Pipelines



Sines - Setúbal Natural Gas Pipeline

Sines – Setúbal (Portugal)

Work Description

Natural Gas Pipeline (87 km) between Sines and Setúbal including the longest Horizontal Direction Drilling (HDD) in Europe, 4500 m across the Sado River Estuary.

Pipework: steel pipe, API 5L CL. Gr. X-70 (Ø 800 mm) with polyethylene exterior coating. HDD installation of 800 mm / 17,5 mm pipeline at the following crossings: Santo André, Salinas do Sado, Sado Estuary (4 HDD), Várzea do Sado, and Rio do Sado (8 HDD altogether).

Engineering: Eng. Luís Colen + Seth, SA.



Work Summary

Client	TRANSGÁS Sociedade Portuguesa de Gás Natural, SA
Contract Type	Unit Price
Construction Period	2023
Cost	€ 21 667 182,00



Gas Pipelines



Complete Conventional Buoy Mooring (CBM) system for the CLCM Caniçal Marine Terminal

Caniçal – Madeira (Portugal)

Work Description

Seth has completed a contract for the design and supply of a complete Conventional Buoy Mooring (CBM) system for the CLCM.

The CLCM terminal is a Joint Venture including GALP Energia (Petrogal) providing the main import facility for LPG, black and white products (gasoline, diesel, fuel oil and kerosene) for the energy and power consumption for the island. Scope of supply consists of four CBM buoys, complete with mooring system and quick release hooks, three combined pipeline end manifolds (PLEMs) and hoses, and the complete control and instrumentation via umbilical towards the shore terminal control room.

Seth used as technological partner the Dutch company Bluewater Energy Services B.V..



Work Summary

Client	CLCM Companhia Logística de Combustíveis da Madeira, Lda.
Contract Type	Turn-Key
Construction Period	2023 - 2024
Cost	€ 11 831 295,34





Gas Pipelines



Socorridos Multipurpose Terminal

Câmara de Lobos – Madeira Island (Portugal)

Trabalhos efectuados

Esta Seth, SA, carried out the remodelling of the Socorridos Multipurpose Terminal on the island of Madeira, in front of the Socorridos Stream at Câmara de Lobos.

This job involved the construction of a marine terminal to supply fuel to the Vitória Power Station on the island of Madeira.

This infrastructure, which supplies fuel from tankers moored about 560 m from the shore, comprises three buoys used to moor the ship, about 75 m of Ø10" fuel hose and 560 m of Ø12" steel pipeline.

The following work was carried out in accordance with the initial contract.

Removal of 4 buoys and respective chains and accessories, concrete blocks and anchors.

The steel buoys weigh about 5 tonnes each and have a diameter of 4 m at the water line and a total height of 4 m. (These four sets of buoys were removed from the sea in front of the Formosa breach, where the Shell discharging facility used to be).

Laying just three of these sets (buoys + accessories + plus blocks and anchors) in front of the Cimentos Madeira Marine Terminal near the mouth of the Socorridos Stream.

Construction of a 560 m sea-line of Ø12", 12 mm wall, steel pipes welded together. The pipe ends at a PLEM (Pipe-Line End Manifold) built of reinforced concrete. On shore, the pipe is connected to another pipeline (the construction of which was not a part of our contract) that delivers the fuel to the storage tanks.

The PLEM includes steel piping and a set of seven Ø10" hoses totalling about 75 m. A shut-off valve was installed between the two pipelines.

A Breakaway Coupling valve was fitted between the 1st and 2nd hoses.

The steel piping of the sea-line is protected with Reno mattresses (wire mesh baskets 4.0 x 2.0 x 0.3 m filled with 5-10 cm crushed stone).

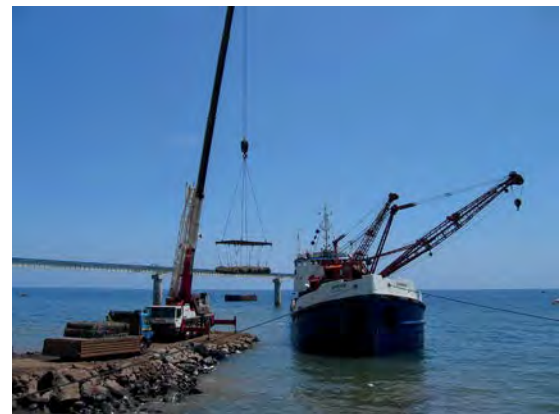
As an addendum to the initial contract, Seth was awarded the overhaul of the 4 buoys (shot-blasting, sundry repairs, painting and fitting of lanterns fed by solar panels).

The 4 buoy. Th buoy is located at the Vitória Power Station and will act as a spare A Sea Mark Plan was prepared by the Portuguese Hydrographic Institute.

The Employer in this contract was EDM– Electricidade da Madeira, which acted in close co-operation with CLCM– Central Logística de Combustíveis da Madeira.

Work Summary

Client	EDM - Electricidade da Madeira
Contract Type	Turn-Key
Construction Period	2006
Cost	€ 1 800 000,00





Gas Pipelines



Jet Fuel Pipeline from Off-base Depot and Additional On-Base Storage

Porto Santo Island, Madeira Archipelago (Portugal)

Work description

This work involved remodelling the Military Fuel Supply and Storage System at the Porto Santo Island Aerodrome.

The contract (Project NATO 99/7PL40601), included work in several areas: civil construction, foundations and structures, mechanical works, electricity, roadways, waters and drains.

Main quantities

- Distribution manifold building
- Two underground steel tanks (500 m3 each), covered with reinforced concrete
- Waste Tank and Fuel Tank, complete with ladders and walkways providing access to respective covers
- Two fuel pits at the Fuelling Bay and another two at the Apron
- Construction of earth retaining embankments and walls
- 3200 metres of 6" diameter carbon steel connecting pipeline
- Related DWV, landscape and electrical works



Work Summary

Client	Portuguese Ministry of Defense (MDN)
Contract Type	Turn-Key
Construction Period	2003 - 2004
Cost	€ 4 982 652,00



Energy



Belo Jardim Power Plant Addition

Terceira Island, Azores (Portugal)

Work Description

With a view to increasing the electric power available on Terceira Island in the Azores, EDA- Electricidade dos Açores, signed a contract with BWSC-Burmeister & Wain Scandinavian Contractor a/s, for the design and construction of the enlargement of the Belo Jardim Power Station.

This enlargement included the erection of two 4-stroke diesel generator sets with a combined mechanical power of 12.6 MW and 6.1 MW of useful electric power.

All the civil construction works (power station building, workshops, office buildings and ancillary structures), fuel tanks, gas exhaust chimney, accesses and exterior works and landscaping were awarded to Seth.

The civil construction works also include construction of the engine foundation pads— each involving 120 m3 of concrete.

SETH's work share

- Station building: 1350 m2
- Overhead crane: 35 ton
- Exhaust stack height: 30 m
- Tank farm: 8 tanks / 890 m3 total

Architect & Engineer: BWSC - Burmeister & Wain Scandinavian Contractor A/S



Work Summary

Client	B.W.S.C. a/s - EDA
Contract Type	Turn-Key
Construction Period	1995 – 1997
Cost	PTE 700.000.000 USD 3,700,000





Energy



Ribeira Grande Geothermal Plant

S. Miguel Island, Azores (Portugal)

Work Description

The geological characteristics of the Azores (located in one of the world's regions of greatest seismic activity) have allowed the construction of a power station in which the working fluid is the steam produced within the earth's crust, captured at a depth of 600 metres. The Ribeira Grande geothermal power station is one of the few in the world. Since its construction it has constituted the benchmark for this type of facility.

The project was developed in two stages, leading to a total electric power production of 14 MW (13 MW in the grid), accounting for some 20% of the total electricity consumption of the island of São Miguel.

The 1st stage (6 MW) was completed in 1993 and the 2nd stage (8 MW) in 1999.



General view of the Ribeira Grande Geothermal Plant
Foreground: the condenser yard

SETH's work share

- Control building
- Pipework foundations
- Pipe bridges
- Fire pump building
- Emergency generator building

Architect & Engineer: Ormat Atlantic, Inc.

Work Summary

Client	Ormat Atlantic / EDA
Contract Type	Turn-Key
Construction Period	1992 - 1993 (1st Phase) 1998 (2nd Phase)
Cost	PTE 160.000.000 (1ª F) PTE 140.000.000 (2ª F)





Military Facilities



Fire/Crash Rescue Station

United States Navy – Lajes Field, Terceira Island, Azores

Description of Work

The Fire Crash Rescue Station was awarded in may 2006 by the U.S. Navy and it was completed in june 2008.

The project consists of one 2.300 m2 building composed by a two story reinforced concrete building and a 10 fire trucks bay area built in structural steel, with reinforced concrete exterior walls and gypsum wall board interior walls. As part of the building we have the control room, communications room, electrical room, mechanical room, generator room, resting rooms, dining room, kitchen, lockers, laundry and offices.

Beside the “normal” specialties as water, drain, electrical e communications, was included in our scope of work the supply and installation of a hydraulic elevator, all the systems as: air conditioning, fire alarm, monitoring of all base alarms, mass notification system, fire/crash rescue vehicle exhaust removal system.

Design: Benham (Saint Louis, Missouri, USA)

Construction Supervision: United States Navy



Work Summary

Client	United States Navy
Contract Type	Turn-Key
Construction Period	2006 - 2008
Cost	€ 7 490 000,00



Military Facilities



Fitness Center – Phase II

United States Navy – Lajes Field, Terceira Island, Azores

Description of Work

The Fitness Center, Phase II was awarded in December 2004 by the U.S. Navy.

The project was the construction of a two-floor building with approximately 9.800 SF structural steel, reinforced concrete exterior walls and gypsum wall board interior wall. As part of the building, we have the communication room, electrical room, mechanical room, offices, aerobics room, open gym and lockers room.

Beside the “normal” specialties as water, drain, electrical e communications, was included in our scope of work the supply and installation of a hydraulic elevator, all the systems as: air conditioning, music, commercial intrusion detection system and fire alarm system.

Design: Clark Nexsen, USA

Construction Supervision: United States Navy



Outside view of the Fitness Center



Inside view of the gimnasium

Work Summary

Client	United States Navy
Contract Type	Turn-Key
Construction Period	2004 - 2006
Cost	€ 4 592 500,00



Military Facilities



Dental Clinic

United States Navy – Lajes Field, Terceira Island, Azores

Description of Work

The dental clinic was awarded in September 2003 by the U.S. Navy. The contract amount was approximately 3,123,000.00 USD and it was completed in May 2005.

The dental clinic is a structural steel building with concrete masonry exterior wall and gypsum wall board interior wall. The facility can be divided in five main areas: public, administration and records, services, doctor rooms and equipment rooms.

It was scope of work the supply and installation of all the systems as: air conditioning, dental air, oral evacuation, oxygen, sterilizer, music and fire alarm system as well as all the cabinets for the doctor rooms, lab and X-ray room.

Design: RLF, Florida, USA

Construction Supervision: United States Navy



Work Summary

Client	United States Navy
Contract Type	Turn-Key
Construction Period	2003 - 2005
Cost	USD 3 123 000.00



Military Facilities



Replace Military Family Housing, Phases I, II and III

US Navy - Lajes Field, Azores (Portugal)

Project description

- Construction of 154 family housing units
- Asbestos abatement and demolition of 28 existing housing units
- DWV networks
- Electrical installation
- Sidewalks, driveways and landscaping

(Architect & Engineer: Baker and Associates)



Work Summary

Client	U.S. Air Force /U.S. Navy
Contract Type	Turn-Key
Construction Period	2001-2005
Cost	USD 43,000,000.00





Military Facilities



POL Tank Corrosion Control

US Navy - Lajes Field, Azores (Portugal)

Description of Work

- Surface repairs
- Sand and shot blasting
- Inside cleaning and repair
- Replacement of pipe supports
- Fabrication and erection of steel structures
- Overall repainting

Architect & Engineer: Austin Brockenbrough & Ass.



Work Summary

Client	U.S. Navy
Contract Type	Turn-Key
Construction Period	1999 – 2000
Cost	USD 2,960,000.00





Military Facilities



Replace Pumphouse and Tanks

US Navy - Lajes Field, Azores (Portugal)

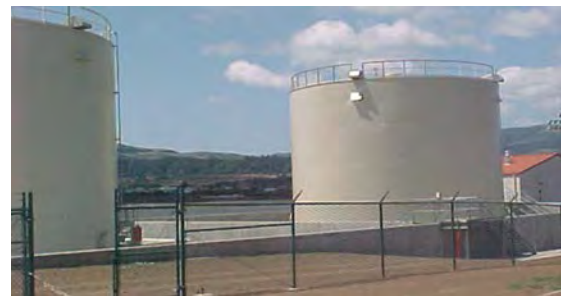
Description of Work

- Construction and erection of 2 jet fuel tanks with 160 cu.m each and associated containment dikes.
- Construction of the pumphouse and control building.

Supply and installation of the following equipment:

- 5 fueling pumps (38 liters/s)
- Truck loading island
- 6 ramp hydrants
- SS and CS piping and associated valves and control valves
- PLC control system
- Cathodic protection system

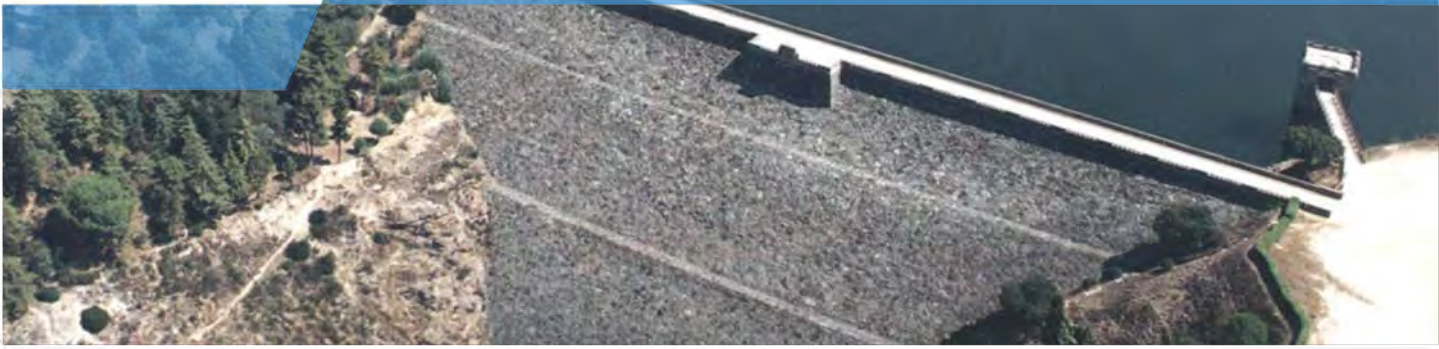
Architect & Engineer: Robert International



Work Summary

Client	U.S. Navy
Contract Type	Turn-Key
Construction Period	2001 – 2002
Cost	USD 6,540,000.00





Historical Works



Pego do Altar Dam

Santa Catarina River, Setúbal (Portugal)

Description of Work

Rockfill dam with an upstream watertight face made of welded stainless-steel plates with elastic joints. This technical solution is quite uncommon but has shown an excellent behaviour along the years.

The stored water is used for irrigation of the downstream hydroagricultural development and in hydroelectric production.

Height: 63 m

Crest length: 192 m

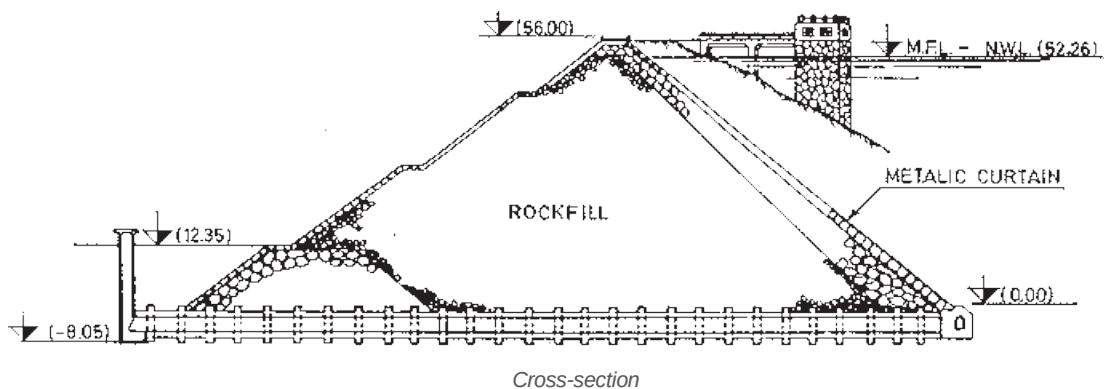
Spillway: Controlled

Dam volume: 371 000 m³

Reservoir: 876 ha / 94 hm³



Project included in the "100 Civil Engineering Works of the 20th Century" selection by the Portuguese Order of Engineers.



Work Summary

Client	Associação Regantes do Vale do Sado
Engineering	JAOHA
Construction Period	1949
Cost	N/D



Historical Works



Vale do Gaio Dam

Xarrama River, Alcácer do Sal (Portugal)

Description of Work

Dam with an earthfill part, on the upstream side, and a rockfill part on the downstream shoulder. An asphalt sealing curtain was built between them.

Height: 51 m

Crest length: 368 m

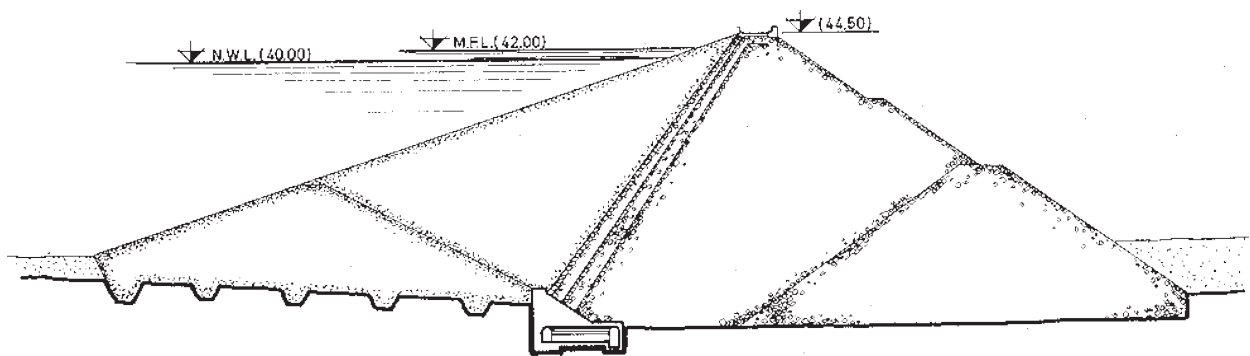
Spillway: Controlled

Dam volume: 636 000 m³

Reservoir: 550 ha / 63 hm³



Project included in the "100 Civil Engineering Works of the 20th Century" selection by the Portuguese Order of Engineers.



Cross Section

Work Summary

Client	Associação Regantes do Vale do Sado
Engineering	Engº Augusto Poppe
Construction Period	1949
Cost	N/D





Historical Works



Marechal Carmona Bridge

Tagus River, Vila Franca de Xira (Portugal)

Description of Work

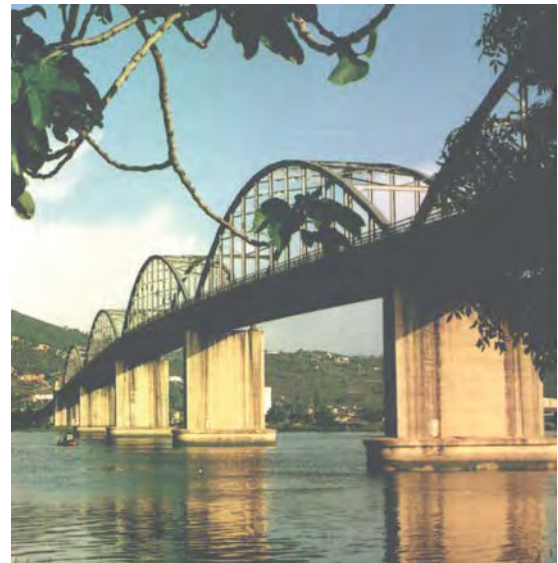
5-span steel deck bridge, supported by reinforced concrete pylons. The steel deck is formed by Lang beams, with straight lower flanges and a parabolic arch in the upper flange. The foundations are composed by 37 pylons, 4 of which are located in the river and 2 as transition elements between the steel and concrete sections of the bridge.

Geometric data

- Total length, including abutments: 1224 m
- Steel deck: 524 m
- Spans: 5 x 104 m
- Deck width between railings: 12 m

Construction Consortium:

Seth, Lda. + Dorman, Long & Co., Ltd.



Work Summary

Client	JAE / Dir. Serviço de Pontes
Contract Type	Design-construction
Construction Period	1948 – 1951
Cost	PTE 42 000 000,00





Historical Works



Vala Nova Bridge

Benavente, Santarém (Portugal)

Description of Work

First pre-stressed concrete bridge built in Portugal

Concrete bridge with a pre-stressed concrete deck. Designed and built by SETH, whose designing engineer, Mr. Francisco António Manuel Pedroso Bélarde Lebre de Vasconcelos Mello, decided to build the deck with pre-stressed concrete. In the 50s, the pre-stressing of concrete elements was already being used in Portugal for other concrete elements, but never on bridges of any size. The pylons are supported by driven concrete piles with a diameter of 60 cm and an approximate length of 25 m. The pre-stressing was done by the Freyssinet method.



Geometric data

- Total length: 108 mm
- Spans: 3 x 33,8 (aprox.)
- Width between railings: 11,4 m
- Method: Method Freyssinet

Work Summary

Client	JAE / Dir. Serviço de Pontes
Contract Type	Design-construction
Construction Period	1953-1954
Cost	PTE 8.000.000,00

