

**Reconversão do Cais 4, Terminal Gases Liquefeitos Criogénicos
Terminal Multipurpose de Sines – Sines, Setúbal****Reconversion of Pier 4, Cryogenic Liquefied Gas Terminal
Sines Multipurpose Terminal – Sines, Setúbal (Portugal)****Descrição dos trabalhos**

A APS – Administração dos Portos de Sines e do Algarve, S.A., adjudicou à Seth a empreitada de Reconversão do Cais 4 do Terminal Multipurpose de Sines (Cais 4 TMS), de modo a estarem criadas as condições necessárias para vir a operar gases liquefeitos criogénicos.

As principais intervenções a realizar incluem a:

- Relocalização do posto de acostagem em 150 m para SW;
- Construção 3 novos duques d'alba de acostagem e de amarração de navios;
- Construção de 4 maciços em terra, de amarração dos cabos dos navios;
- Construção de plataforma de 40x20 metros (Duque d'Alba) para instalação de braços de carga e/ou mangueiras dos navios tanque e para instalação de mangueiras para movimentação dos produtos criogénicos, incluindo uma ponte de apoio da esteira de tubagens de ligação a esta plataforma.

Com esta empreitada, a área de intervenção do cais passará de 1,83ha para 2,09 e, a cota de fundo permanecerá a mesma (-15 ZH).

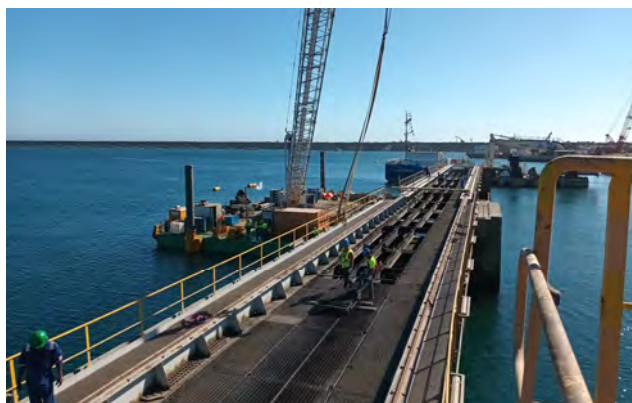
Description

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 1.83ha to 2.09ha and the bottom level will remain the same (-15 ZH).

**Resumo da Obra****Work Summary**

Cliente
Tipo de contrato
Data de construção
Custo

APS, SA (Administração do Porto de Sines e do Algarve)
Lump Sum
2023... In progress
EUR 11.831.295,34

Client
Contract type
Construction period
Cost

Dragagens Malongo (Chevron)

Malongo (Cabinda), Angola

Works of dredging in the basin of CREVRON Port

Malongo (Cabinda), Angola

Descrição dos trabalhos

A empreitada, executada em Consórcio, consistiu na dragagem de 170.000,00 m³ na área de acostagem das docas 1 e 2 do Porto da Chevron em Malongo, Cabinda.

A cota de dragagem definida foi de -6.5m (LAT).

A dragagem foi executada com recurso a uma Cutter Suction Dredger (CSD 450), que descarregava o material numa bacia de retenção temporária, cuja função era a de decantar a mistura dragada garantindo a retenção da areia, para ser transportada e descarregada em local próprio.

De modo a garantir a celeridade das tarefas de remoção do material, uma das frentes de trabalho foi dedicada à extração de areia com recurso a maquinaria de movimentação de terras. Numa fase mais avançada, surgiu ainda uma nova frente constituída por uma DOP Pump e grua de rastos, para colmatar a área a dragar junto às paredes das docas.

Os trabalhos adjudicados englobaram também a colocação em depósito em terra de todo o material dragado, usando para o efeito uma área “a seco” de aproximadamente 8.000,00 m² localizada a 3 Km do cais.

Números mais significativos / Main work volumes:

Dragagens / Dredging: 170.000,00 m³

Meios especiais utilizados / Equipment used:

Draga de sucção “Cutter Suction Dredger (CSD 450)

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.

Resumo da Obra

Work Summary

Cliente	Cabinda Gulf Oil Company Limited (CABGOC)	Client
Tipo de contrato	Preço global Lump sum	Contract type
Data de construção	2022-2023	Construction period
Custo	4.604.440,28 EUR	Cost



Zona das dragagens durante os trabalhos sendo visível a draga de sucção.
Zone of dredging during the works, being visible the suction dredger CSD 450.



Frente de trabalhos com recurso a maquinaria de movimentação de terras.
Extracting sand using earthmoving machinery.

Beneficiação e Ampliação do Cais Comercial de Ponta Delgada

Ilha de S. Miguel, Açores

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

Description of Works

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.

Scope of Works

• Maritime Works:

- 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.



Main quantities:

- 17 caissons with 2500 tons / unit w/ dimension 28 m x 11.5 m x 14m
- Dredging:
 - Incoherent material – 100,000.00m³;
 - Coherent material – 41,000.00m³;
- Supply and application of concrete – 25000.00m³;
- Supply and application of 3200 tons of steel reinforcement;
- Application of 120,000.00m² of formwork;
- Supply and application of 65,200.00m³ of rockfill;
- Construction of 2,250.00m² of buildings.

Resumo da Obra

Work Summary

Dono-da-Obra
 Tipo de contrato
 Data de construção
 Custo

Portos dos Açores, SA
Lump Sum
2020-2023
EUR 42.650.000,00 (Final Cost including price escalation)

Client
Contract type
Construction period
Cost

Ampliação e modernização do Porto Inglês, na Ilha do Maio

Ilha do Maio, Cabo Verde

Extension and improvement of English Quay***Island of Maio, Cape Verde*****Description of Works**

Seth, in consortium with two companies, one Portuguese and the other Cape Verdean, was responsible for carrying out the modernization and expansion works of Porto Inglês, in Maio Island, for a total value of € 17.8 million.

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.

**Resumo da Obra*****Work Summary***

Dono-da-Obra

**Ministério das Infra-Estruturas,
do Ordenamento do Território e da Habitação
da República de Cabo Verde***Client*

Tipo de contrato

Lump Sum*Contract type*

Data de construção

2019-2022*Construction period*

Custo

EUR 20.805.758,63 (Final Cost including price escalation)*Cost*

Construção de um Cais Acostável de Navios no Porto de Aveiro**Porto de Aveiro, Aveiro****Jetty Berth at Aveiro Port****Aveiro Port, 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).

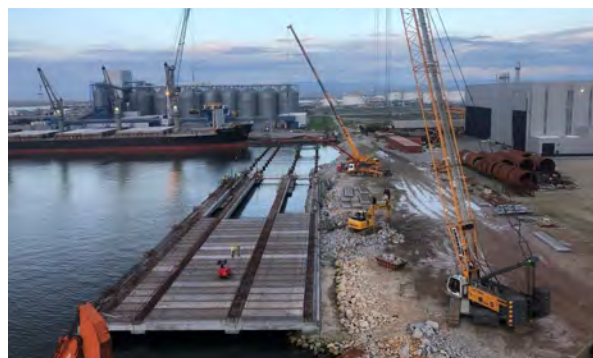
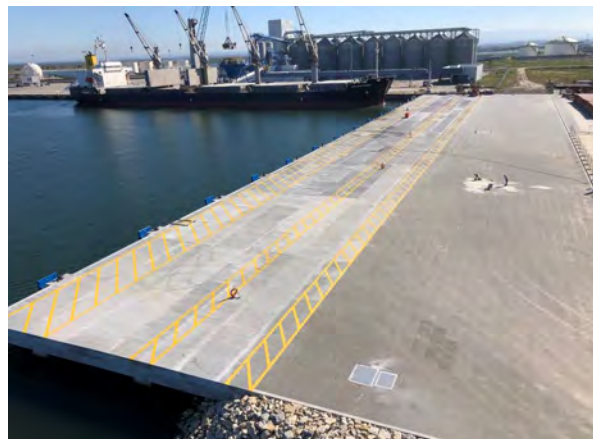
This berth was designed to support the productivity of companies that install production units in the Port of Aveiro, and was assumed to be strategic to allow the appropriate transport operation for the dimensions and weight of the elements in question, reducing logistical costs that would be associated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

**Resumo da Obra****Work Summary**

Cliente
Tipo de contrato
Data de construção
Custo

Administração do Porto de Aveiro
Lump Sum
2020 – 2021
EUR 6.848.532,32

Client
Contract type
Construction period
Cost

Duques d'Alba e Recuperação da Ponte-Cais
Porto da CLC, República da Guiné-Bissau
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.


Resumo da Obra
Work Summary

Cliente
 Tipo de contrato
 Data de construção
 Custo

CLC GALP, Guiné-Bissau
Lump Sum
2019 – 2020
EUR 7.546.886,26

Client
Contract type
Construction period
Cost

Construção do Novo Quebra-Mar e Cais do Porto de Cabinda

Cabinda (República Popular de Angola)

New Breakwater and Quay of Cabinda Port **Cabinda, Republic of Angola**

Description of works

In 2017, Seth started the consortium work on the sub-contract 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:

- Vibrating 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



Resumo da Obra

Work Summary

Dono-da-Obra
 Tipo de contrato
 Data de construção
 Custo

Porto de Cabinda
Lump Sum
2018-2022
USD 42.700.000,00

Client
Contract type
Construction period
Cost

Instalação de Cabo Submarino para ligação de Waveroller Peniche, Portugal

Subsea Cable Installation to connect a Waveroller Peniche, Portugal

Scope of Work

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: 1600m³

Number of Buoys used: 130 units

No. of Cable 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).



Resumo da Obra Work Summary

Cliente	AW - Energy OY
Tipo de contrato	Lump Sum
Data de construção	2019
Custo	EUR 54.918,89

Client
Contract type
Construction period
Cost

Cais de Exportação de Bauxite
Port Taresa (Kamsar), República da Guiné

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.

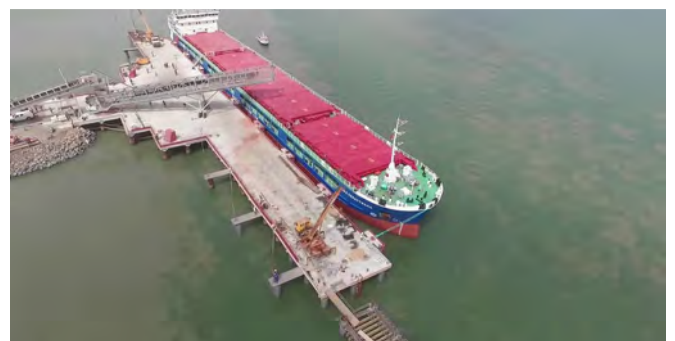
The Contract Price is in the amount of 6 million euros (all materials provided by COBAD) and had a scheduled duration of 10 months.

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 17.50 meters);
- 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).



Resumo da Obra

Work Summary

Cliente

COBAD, SA

(Compagnie de Bauxite et d'Alumine de Dian-Dian)

Client

Tipo de contrato

Lump Sum

Contract type

Data de construção

2017-2018

Construction period

Custo

EUR 6.999.789,10

Cost

**Terminal de Contentores de Kamsar, Fase III
Porto de Kamsar, República da Guiné*****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 (during 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.

**Resumo da Obra
*Work Summary***

Cliente	GAC Guinea Alumina Corporation	<i>Client</i>
Tipo de contrato	Lump Sum	<i>Contract type</i>
Data de construção	2015-2016	<i>Construction period</i>
Custo	EUR 12.401.909,85	<i>Cost</i>

Cais de Pesca Profissional

Montijo

Fishing Harbour

Montijo (Portugal)

Trabalhos efectuados

A SCUPA – Sociedade Cooperativa União Piscatória Aldegalense, CRL adjudicou à Seth a empreitada da construção de um cais de pesca profissional por forma a promover a criação e consolidação, no Montijo, das condições físicas necessárias ao desenvolvimento da actividade piscatória.

Numa iniciativa financiada pelo 2.º Concurso ao Eixo 4 do PROMAR, promovido pelo Grupo de Acção Costeira Além Tejo, o projecto executado visou a criação de:

- Um espaço de acostagem de 12 a 13 embarcações em simultâneo (com arqueação máxima de 8,35 Ton;
- Uma rampa de varadouro para acesso das embarcações e manutenção/reparação das mesmas;
- Uma plataforma de cais dimensionada para permitir a colocação de embarcações em local plano e seco;
- Uma área destinada à integração de instalações de apoio individuais para guardar aprestos de pesca.

Em simultâneo, a SCUPA pretendeu a requalificação ambiental e paisagística local, a reabilitação do espaço envolvente da antiga Salina e Viveiro de Peixe e a preservação do antigo moinho de marés e das ruínas existentes no local.

Esta empreitada foi inaugurada em 23 de Janeiro de 2016.

Work description

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

The works 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.

Resumo da Obra

Work Summary

Cliente	SCUPA – Sociedade Cooperativa União Piscatória Aldegalense, CRL.
Tipo de contracto	Valor Global / Lump-sum
Construtores	Seth, SA
Data de construção	2015-2016
Custo	€ 548.523,00

<i>Client</i>
<i>Contract type</i>
<i>Contractor</i>
<i>Construction period</i>
<i>Cost</i>



Enlargement of the open-air storage yard and construction of a new access road in the northeast region of the great port of São Vicente

City of Mindelo, Island of São Vicente, 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.



Laginha Beach after completion of sand filling



General view of the port area with embankment construction in progress

Resumo da Obra

Work Summary

Cliente	Ministério das Infraestruturas, Transportes e Telecomunicações de Cabo Verde	<i>Client</i>
Tipo de contracto	Valor Global / Lump-sum	<i>Contract type</i>
Construtores	Seth, SA (in Consortium)	<i>Contractor</i>
Data de construção	2013-2014	<i>Construction period</i>
Custo	€ 14.309.000,00	<i>Cost</i>

Ampliação do Molhe Norte

Gibraltar

North Mole Extension

Gibraltar

Work Description

The contract of the "North Mole Extension" is the extension of Quay/Breakwater located in the northwestern part of the peninsula of Gibraltar.

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 equipments, namely a dredger with backhoe and a pontoon.

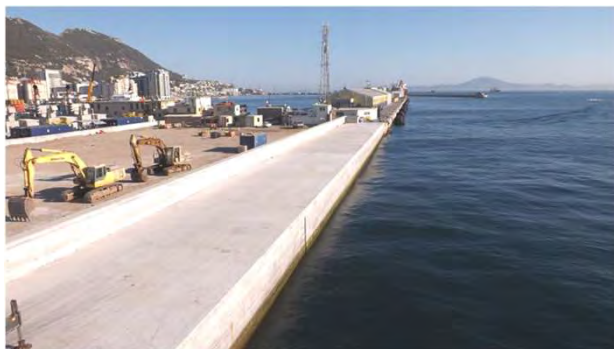
The works will end with the execution of a top slab of *in-situ*.

Below description of the main quantities of this project:

- Caissons: 9 units;
- Concrete: 9.000 m³;
- Steel rebars: 850 ton;
- 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.



Resumo da Obra

Work Summary

Cliente	Government of Gibraltar (by Casais, SA)
Tipo de contracto	Valor Global / Lump-sum
Construtores	Seth, SA (em consórcio)
Data de construção	2014-2015
Custo	€ 11.750.000,00

Client
Contract type
Contractor
Construction period
Cost

Construção da Expansão do Porto de Porto Novo – 1.^a Fase

Ilha de Santo Antão, Cabo Verde

Porto Novo Harbour – 1st. Phase

Santo Antão Island, Cape Verde

Work description

Seth executed (in consortium) the following structures: quay block wall 40 m long with service depth of -3.0 m (ZH); multipurpose block wall quay 115 m long with a service depth of -6.0 m (ZH), equipped with a RO-RO ramp; extension of a second multipurpose block wall quay by 45 m totalling 135 m of length and a service depth of -7.0 m (ZH), also equipped with a RO-RO ramp, for cargo and passengers use.

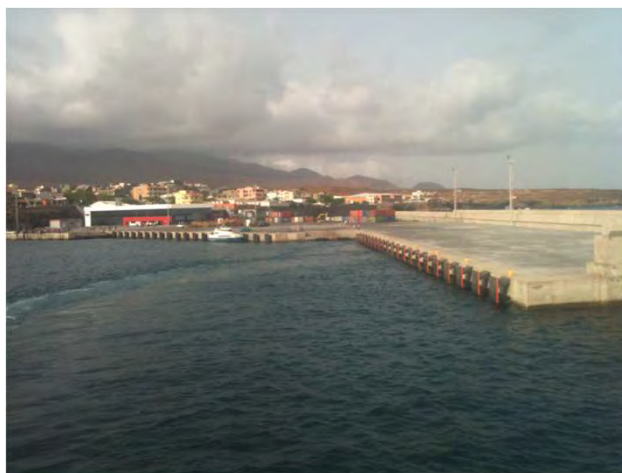
A storage area with 1,7 HA of area was also executed for cargo and container storage purposes. This storage area is protected by 500 m long breakwater and sea wall.

A boat slip was also executed to assist the fishing activity.

The project also included the construction of ground facilities, including a maritime passenger terminal of 2,000 m².



Zone of berths after completion of the work



General view of the port area after project conclusion

Main quantities

Dredging and blasting rock: 11,000 m³

Concrete blocks, caissons: 7,200 m³

Concrete in curtain wall: 10,000 m³

Rockfill, quarry-run: 320,000 m³

Rockfill underwater: 66,000 m³

Work Summary

Client	Ministério das Infraestruturas, Transportes e Telecomunicações de Cabo Verde
Contract type	Lump-sum
Contractor	Seth, SA (lead company, in consortium)
Construction period	2010-2012
Cost	€ 26.319.577,00

Ampliação e Reabilitação do Cais da ENACOL

Mindelo, Cabo Verde

Improvement and Rehabilitation of the Quay of ENACOL

Mindelo, Cape Verde

Trabalhos efectuados

A SETH executou (em consórcio) a obra de ampliação e melhoramento do molhe cais da ENACOL (empresa petrolífera de Cabo Verde) na cidade de Mindelo, Ilha de S.Vicente.

Ao abrigo do contrato foram executados os seguintes trabalhos:

- Construção de um terrapleno para circulação de viaturas e camiões cisterna, a construir sobre a zona molhada existente e com uma área de cerca de 1600 m²;
- Ampliação do molhe-cais existente com 4/5 m de largura, para 10/12 m, totalizando o aumento desta zona, uma área de cerca de 1100 m².
- Construção de um cais acostável com 40 m de comprimento, em substituição do existente (que apenas tinha 10m).
- Melhoramento do molhe cais na face oposta à ampliação atrás referida, recorrendo à construção e aplicação de aduelas em betão armado, vindo estas, a esconder a face existente, constituída por alvenaria de pedra argamassada.
- Construção de uma caleira enterrada para alojamento de tubagens de combustível (que estavam fixadas em suportes e poleias metálicas acima do piso de circulação pedonal do molhe cais existente).
- Construção de uma laje de pavimento geral sobre toda a toda a área existente e ampliada.



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 included the following works:

- Construction of a platform for movement of vehicles and other mobile equipment, by reclamation of an area of 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 covered duct for fuel lines.
- Pavement of the new areas with a reinforced concrete slab.

Resumo da Obra

Work Summary

Cliente	ENACOL	Client
	Empresa Nacional de Combustíveis, SA	
Tipo de contracto	Valor Global / Lump-sum	Contract type
Construtores	Seth, SA (em consórcio)	Contractor
Data de construção	2014	Construction period
Custo	€ 1.600.000,00	Cost



Reabilitação do Cais 22 no Terminal dos Granéis Líquidos

Porto de Aveiro

**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



Antes dos trabalhos de reabilitação
Before rehabilitation works



Depois de concluídos os trabalhos de reabilitação
After conclusion of the rehabilitation works

Resumo da Obra

Work Summary

Cliente	SGPAMAG Sociedade de Granéis do Parque de Aveiro, Movimentação e Armazenagem de Granéis, S.A	<i>Client</i>
Tipo de contrato	Preço global Lump sum	<i>Contract type</i>
Data de construção	2013-2014	<i>Construction period</i>
Custo	426.000,00 EUR	<i>Cost</i>

Reabilitação da Ponte-Cais do Parque da Tanquisado

Mitrena, Setúbal

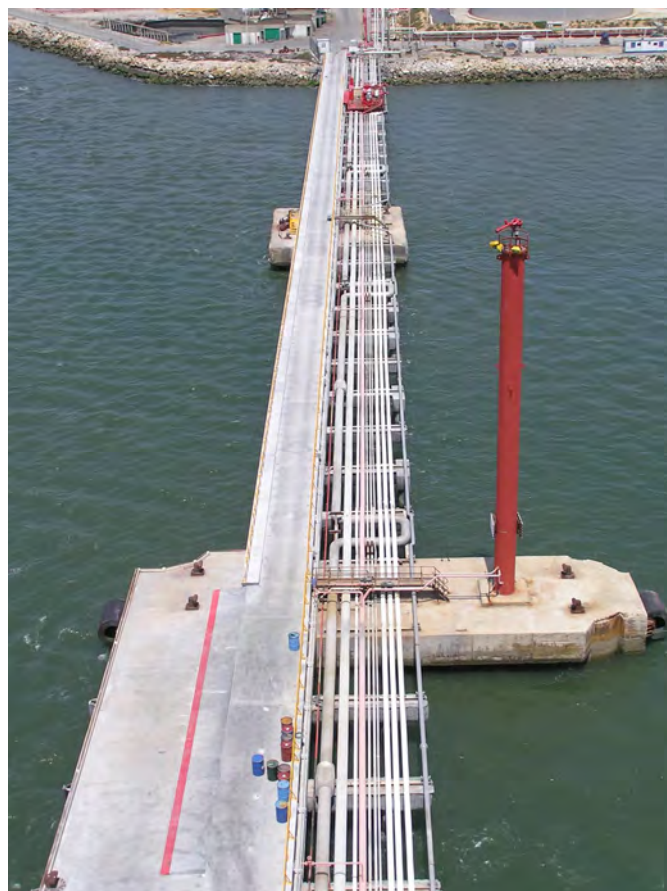
Rehabilitation of the existing Jetty *Mitrena, Setúbal (Portugal)*

Descrição dos trabalhos

O objectivo da empreitada resumiu-se à reabilitação da ponte-cais existente e ao reforço da referida ponte-cais do Parque da Mitrena com a execução de 34 novas estacas no tabuleiro de acesso.

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.



Resumo da Obra

Work Summary

Cliente	Tanquisado - Terminais Marítimos, SA	<i>Client</i>
Tipo de contrato	Preço global Lump sum	<i>Contract type</i>
Data de construção	2003-2004	<i>Construction period</i>
Custo	1.161.175,00 EUR	<i>Cost</i>

Dragagens nos Estaleiros Navais de Porto Amboim

Porto Amboim, Angola

Dredging works in the basin of PAENAL shipyard

Porto Amboim, Angola

Descrição dos Trabalhos

Dragagem de 650.000 m³ de areia da bacia do cais com draga de sucção "GEFION R" da Rhode Nielsen.

Remoção de 1.300 m de pipelines e diversas estruturas (maciços de betão, âncoras, cabos de aço, destroços diversos) enterradas no leito da bacia com embarcação tipo Multicat auxiliado por bomba de dragagem de areia "DOP" e equipa de mergulhadores.

Números mais significativos:

650.000,00 m³ de dragagens

Meios especiais utilizados:

Draga de arrasto e sucção "GEFION R" da R&N

Bomba de dragagem de areia DOP

Embarcação multicat "JIFWORKER" da Jifmar



Dredging with DOP pump

The scope of work included:

Dredging of one basin with a Rhode Nielsen (R&N) trailing hopper suction dredger (650,000.00 m³).

Removal of sundry equipment buried in the sea bed (pipelines, concrete blocks, anchors, steel cables).

This work was made with a vessel type Multicat aided by a dredge pump "DOP" and a diving team.

Most significant figures:

650,000.00 m³ of dredging

Special Means:

Trailing hopper suction dredge "Gefion R"

Dredge pump type DOP

Vessel type Multicat



Draga de arrasto e sucção na bacia do cais dos estaleiros navais de Porto Amboim
 Trailing hopper suction dredger
 in the dock of PAENAL shipyard of Porto Amboim

Resumo da Obra

Work Summary

Cliente	PAENAL	<i>Client</i>
Tipo de contrato	Porto Amboim Estaleiros Navais, Lda Preço global Lump sum	<i>Contract type</i>
Data de construção	2013	<i>Construction period</i>
Custo	9.228.265,19 USD	<i>Cost</i>

Defensas no Molhe da Doca dos Pescadores

Doca dos Pescadores, Setúbal

Fender System – Doca dos Pescadores

Setúbal, Portugal

Descrição dos trabalhos

Cais 1: Fornecimento e montagem, incluindo a mobilização de todos os equipamentos e meios necessários, de **12 defensas** cilíndricas em borracha com 400 mm de diâmetro exterior e 200 mm de diâmetro interior, com comprimentos de 3500 mm.

Cais 2: Fornecimento e montagem, incluindo a mobilização de todos os equipamentos e meios necessários, de **38 defensas** cilíndricas em borracha com 400 mm de diâmetro exterior e 200 mm de diâmetro interior, com comprimentos de 3500 mm.

Meios especiais utilizados:

Grua automóvel Liebherr LTM 1100, colocada no local da obra por um navio, devido a esta ser inacessível por terra.

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).



Resumo da Obra

Work Summary

Cliente	APSS – Administração dos Portos de Setúbal e Sesimbra, SA	<i>Client</i>
Tipo de contrato	Preço global Lump sum	<i>Contract type</i>
Data de construção	2017-2018	<i>Construction period</i>
Custo	EUR 187.500,00	<i>Cost</i>

Defensas Nova Cimangola

Luanda, Angola

Rebuilding of Fender System – Nova Cimangola Export Jetty

Luanda, Angola

Descrição dos trabalhos

O âmbito dos trabalhos incluiu:

- Cravação de 36 estacas com 813 mm de diâmetro
- Betonagem das estacas até ao nível do fundo do mar
- Execução de 4 maciços em betão e instalação das defensas.

Números mais significativos:

1300 m³ de betão

8 defensas elásticas Fentek SCN 1400

Meios especiais utilizados:

Grua automóvel Liebherr LTM 1100, colocada no local da obra por um navio, devido a esta ser inacessível por terra.



Work Description

Work included:

- 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) (hauled to site work by boat)



Resumo da Obra

Work Summary

Cliente

Tipo de contrato

Data de construção

Custo

Projectista

NovaCimangola

Preço global

Lump sum

2003-2004

USD 2.200.000,00

Eng. Luís Colen

Client

Contract type

Construction period

Cost

Designer

Projecto de Cassinga - Terminal Mineralífero

Moçâmedes, Angola

Cassinga Project - Ore Terminal

Moçâmedes, Angola

Construção de um molhe acostável em betão pré-esforçado com 600 m de comprimento. Capacidade de acostagem de navios até 300 000 tdw.

Fundação do molhe sobre estacas metálicas cravadas de 43 m de comprimento.

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).



Diversos aspectos dos trabalhos
Several views of the works

Resumo da Obra

Work Summary

Cliente
Tipo de contrato

Companhia Mineira do Lobito
Concepção-Construção
Design-Build

Client
Contract type

Data de construção

1968 - 1972

Construction period

Estacas cravadas

43 m comp./length

Driven piles

Cais de acostagem

600 m

Berthing pier

Navios servidos

300 000 tdw

Ships served

Construção dos Degraus Ribeirinhos
MAAT – Belém, Lisboa

Construction of River Side Steps
MAAT – Belém, Lisbon (Portugal)

Trabalhos Efectuados

A empreitada teve como objectivo a execução de uma nova estrutura marginal na frente ribeirinha do novo Museu de Arte, Arquitectura e Tecnologia da Fundação EDP. Para o efeito, foram executadas um conjunto de intervenções que passaram pela remoção do revestimento de pedra aparelhada existente no talude, a demolição de uma ponte-cais existente e a execução da nova estrutura em degraus pré-fabricados de betão.

Principais quantidades:

88 elementos pré-fabricados instalados em cerca de 150 ml sendo os elementos mais pesados de 19 ton.;
1600 m³ de escavação e dragagem;
Colocação de 360 m³ de betão em talude inclinado;
Demolição de 200 toneladas de betão armado;
Remoção de 1300 m² de pedra aparelhada.

Meios utilizados

Grua de rastros de 110 ton (Kobelco CKE 1100)
Escavadora giratória de 24 toneladas, com braço de 17 m (Case CX 240)
Balde de dragagem
Bóia de sinalização marítima dos trabalhos

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



Resumo da Obra

Work Summary

Cliente	Alves Ribeiro, SA	Client
Tipo de contrato	Valor Global / Lump Sum	Contract type
Data de construção	2016	Construction period
Custo	EUR 485.000,00	Cost

Avanço de Margem e Nova Avenida Ribeira das Naus Cais do Sodré – Terreiro do Paço, Lisboa

Widening the River Bank and New Ribeira das Naus Avenue Cais do Sodré – Terreiro do Paço, Lisbon

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 / 1.20 m diameter)

Rebar cages - 700,000 kg

Concrete – 7,000 m³

Dredging/ Excavation – 20,000 m³

Prefabricated slabs (on the Agencies pontoon) - 45 units. (rebar cages 22,000 kg / concrete 180 m³)

Dolerite basalt paving cubes – 8,000 m²

Trees planted – 48



Resumo da Obra

Work Summary

Cliente
Tipo de contrato
Data de construção
Custo

Câmara Municipal de Lisboa
Série de preços
Fev 2012 – Mar 2013
EUR 3.750.000,00

Client
Contract type
Construction period
Cost

Terminal de Exportação de Clínquer e Cimento

Luanda, Angola

Clinker and Cement Export Terminal

Luanda, Angola

Construção de um molhe acostável em betão armado com 1000 m de comprimento e molhe-testa com 120 m, sobre estacas de 30 m.

Cais de carga, 4 silos de 5000 ton para cimento e clínquer, instalações de ensacagem de cimento, transportadores de correia e diversas estruturas metálicas.

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 klinker silos (5000 ton), cement bagging facility, conveyor belts and miscellaneous steel structures.

Vista dos silos de cimento e clínquer e transportadores de correia.
2º plano: os cais de acesso e acostagem.
*Cement and klinker silos and conveyor belt.
Background: the acess and berthing piers.*



Vista de terra do cais de acostagem
Berthing pier viewed from land



Resumo da Obra

Work Summary

Cliente	CIMANGOLA U.E.M.	Client
Fiscalização	Dar Al-Handasa Consultants (Beirute)	Inspection agency
Tipo de contrato	Concepção-Construção	Contract type
	Design-Build	
Data de construção	1982 - 1984	Construction period
Estacas cravadas	30 m comp./lenght	Driven piles
Cais (acesso/acostagem)	1000 + 120 m	Access + berthing pier

**Terminal de Contentores de Kamsar e Terminal de Descarga de Barcaças
Porto de Kamsar, República da Guiné*****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.

**Resumo da Obra*****Work Summary***

Cliente	GAC Guinea Alumina Corporation	<i>Client</i>
Tipo de contrato	Lump Sum	<i>Contract type</i>
Data de construção	2011-2012	<i>Construction period</i>
Custo	EUR 18.000.000,00	<i>Cost</i>

Reabilitação do Cais Francês no Porto de Kamsar República da Guiné

Rehabilitation of the French Quay - Port of Kamsar Republic of Guinea

Work Carried Out

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.

Description of the Work

- 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.



Resumo da Obra *Work Summary*

Cliente	CBG	<i>Client</i>
	Compagnie des Bauxites de Guinée	
Tipo de contrato	Lump Sum	<i>Contract type</i>
Data de construção	2006-2007	<i>Construction period</i>
Custo	USD 3.000.000,00	<i>Cost</i>
Projectistas	Haskoning UK, Ltd.	<i>Engineering</i>

Trabalhos de reforço do molhe exterior do Porto de Oran

Argélia

Reinforcement of Intermediate Section of the Pier of the Port of Oran **Oran, Algeria**

Descrição dos Trabalhos

Esta foi a primeira obra em que a Seth participou na Argélia, cujos trabalhos feitos em consórcio compreenderam o reforço do troço intermédio do molhe do Porto de Oran, numa extensão de 1287 m.

Foi construída uma banquetta em TOT até à cota -20.00 (ZH) sobre a qual se construiu uma outra de secção trapezoidal em enrocamento de 3 a 6 toneladas até à cota -12.50 (ZH).

Procedeu-se ainda à regularização do talude exterior do molhe com enrocamento de 1 a 3 toneladas, sobre a qual se colocaram os Antifers de 40 toneladas cada.

Sobre o paredão existente, a todo o comprimento, foi construído um muro em betão simples com aproximadamente 1 m x 1 m, que ficou a limitar a camada de Antifers.

Quantidade dos trabalhos

Enrocamento TOT – 254.074 ton

Enrocamento de 1 a 3 ton – 173 092 ton

Enrocamento de 3 a 6 ton – 216 355 ton

Betão em blocos Antifer de 40 ton – 91 928 m³

Fabrico e colocação

de blocos Antifer de 40 ton – 5 505 unidades

Betão em muro-cortina – 2 844 m³

Aço no muro cais – 22 000 Kg



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 - 254,073 tons

Foundation stones from 1 to 3 ton - 173 092 ton

Foundation stones 3 to 6 tons - 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 ton

Resumo da Obra

Work Summary

Cliente	Direction des Travaux Publics de la Wilaya d'Oran	<i>Client</i>
	Argélia / Algerie	
Tipo de contrato	Preço global / Lump sum	<i>Contract type</i>
Data de construção	2007-2010 (27 mois)	<i>Construction period</i>
Custo	EUR 35.176.600,00	<i>Cost</i>
Observações	Job in Consortium	<i>Notes</i>

Reconstrução de um cais na Base Naval de Mers-El-Kébir
Mers-El-Kébir, Argélia***Reconstruction of a Pier at Naval Base of Mers-El-Kébir***
Mers-El-Kébir, Algeria**Descrição dos trabalhos**

- Reparação do caminho de rolamento das gruas, com a construção de vigas de fundação e o fornecimento e aplicação de carris, numa extensão de 520 ml.
- Reabilitação do cais Sul, com a construção da viga de coroamento sobre o cais de blocos existente, numa extensão de 375 m.
- Reabilitação do cais Norte, com a execução de 21 estacas de molde metálico perdido, de 813 mm de diâmetro, na frente do cais.
- Execução de novo cais com infra-estrutura composta por 54 blocos de betão e superestrutura de betão *in-situ*.

Principais quantidades:Escavações: 1.000 m³ / Betões: 3.590 m³

Aço: 325 t

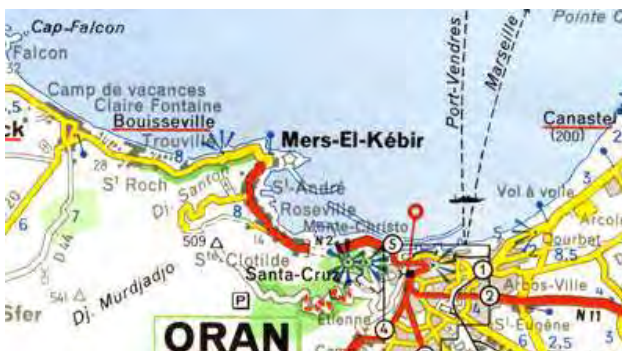
Fornecimento e aplicação de carril: 874 ml

Cabeços de amarração: 43 un

Defensas: 43 un / Enrocamentos: 2.000 t.

**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 1000 m³ / Concrete: 3590 m³ / Steel: 325 t

Supply and installation of rail: 874 ml / Terminals: 43 units

Fenders: 43 units / Rockfill: 2,000 t.

Resumo da Obra***Work Summary***

Cliente	Ministère de la Défense National	
	de la République Algérienne Démocratique et Populaire	
Tipo de contrato	Preço global / Lump sum	Contract Type
Data de construção	2009	Construction period
Custo	EUR 6.405.061,00	Cost
Observações	Job in Consortium	Notes

Plataforma de aterro e taludes de protecção em Koudiet Eddraouch Annaba, Argélia

Platform landfill and protective embankments at Koudiet Eddraouch Annaba, Algeria

Descrição dos Trabalhos

Dique com 350 m de extensão, para protecção da plataforma marítima destinada à construção da estação de bombagem do circuito de refrigeração da central de ciclo combinado.

O dique é composto por núcleo de enrocamento TOT, sub-mantos de enrocamento seleccionado e manto de protecção de enrocamento de 5 a 7 t.

Quantidades de Trabalho

Dragagem: 8.850 m³

Núcleo de enrocamento seleccionado: 13.775 m³

Tela geotêxtil: 8.024 m²

Filtro de enrocamento 3-5 kg: 1.881 m³

Filtro de enrocamento 500-700 kg: 11.252 m³

Manto de enrocamento 5-7 ton: 20.742 m³



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: 8850 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

Resumo da Obra

Work Summary

Cliente	Iberdrola	<i>Client</i>
Tipo de contrato	Preço global / Lump sum	<i>Contract type</i>
Data de construção	2009	<i>Construction period</i>
Custo	EUR 6.500.000,00	<i>Cost</i>
Observações	Job in Consortium	<i>Notes</i>

Reabilitação do Molhe Leste do Porto Petrolífero de Béjaia

Béjaia, Argélia

Rehabilitation of East Breakwater of the Oil Port of Béjaia

Béjaia, Algeria

Descrição dos Trabalhos

Reabilitação do molhe leste do porto petrolífero de Bejaia com submantos de enrocamento seleccionado e mantos de protecção de cubos tipo Antifer de 13 e 24 toneladas.

Quantidade dos trabalhos

Enrocamentos seleccionados: 59.387 m³

Betão em blocos: 20.434 m³



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

Resumo da Obra

Work Summary

Cliente	Ministère des Travaux Publics de l'République Algérienne	Client
Tipo de contrato	Preço global / Lump sum	Contract type
Data de construção	2006-2008 (23 mois)	Construction period
Custo	EUR 7.320.000,00	Cost
Observações	Job in Consortium	Notes

Construção de um Cais no Porto Petrolífero de Béjaia

Béjaia, Argélia

Construction of a Quay in the Oil Port of Béjaia

Béjaia, Algeria

Descrição dos Trabalhos

Construção de cais em estacas prancha, com cota de serviço (-12,00 m)ZH e frente acostável de 78 m de comprimento. O cais é rematado lateralmente por duas estruturas de contenção de 20m de extensão e ligado ao molhe existente por terrapleno com cerca de 35m de largura, em TVC, com camada de desgaste de betão betuminoso. A bacia é dragada à cota -12,00m.

Quantidade dos trabalhos

Dragagem: 450.000 m³
 Estacas-prancha AZ 50: 950 t
 Betão: 1.490 m³ / Aço: 170 t
 Betão betuminoso: 480 t
 Enrocamento 50-200kg: 350 t
 Enrocamento 200-1000kg: 600 t
 Brita 0/40: 1.700 t / TVC 0-200kg: 65.000 t
 Cabeços de amarração de 100t: 12un / Defensas: 4 un

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 ton
 Concrete: 1.490 m³ / Acier: 170 ton
 Bituminous concrete: 480 ton
 Rockfill 50-200 kg: 350 ton
 Rockfill 200-1000 kg: 600 ton
 Broken stone 0/40: 1.700 ton
 TVC 0-200 kg: 65.000 ton
 Bollards type 100 ton: 12 units / Fenders: 4 units



Resumo da Obra

Work Summary

Cliente	SOGEPORIS	<i>Client</i>
	Entreprise Portuaire de Béjaia, EPE	<i>Contract type</i>
Tipo de contrato	Preço global / Lump sum	<i>Construction period</i>
Data de construção	2008-2009 (11 mois)	<i>Cost</i>
Custo	EUR 11.146.000,00	<i>Notes</i>
Observações	Job in Consortium	

Aterro e Ensecadeira Circular para Tomada de Água de uma Central de Ciclo Combinado

Terga, Argélia

Circular cofferdam embankment and outlet for water of a Combined Cycle ***Terga, Algeria***

Descrição dos Trabalhos

Execução de aterro e de uma ensecadeira de forma circular com 70 m de diâmetro, composta por estacas prancha AZ50 com 25 m de comprimento, reforçadas com vigas em anel de betão armado, como trabalho provisório de contenção para a construção de uma tomada de água.

Obra de defesa frontal aderente, com núcleo de enrocamento TVC 50-500 kg e enrocamento de protecção seleccionado com gamas de 0,5-1 ton, 0,5-2 ton, 1-3 ton e 3-5 ton.

Quantidade dos trabalhos

Escavação e dragagens: 44.680 m³

Enrocamentos: 54.760 m³

Estacas prancha AZ50: 1.430 ton



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

Resumo da Obra

Work Summary

Cliente	ORASCOM	<i>Client</i>
Tipo de contrato	Prix Forfaitaire	<i>Contract type</i>
Data de construção	2009-2010 (15 mois)	<i>Construction period</i>
Custo	EUR 14.450.000,00	<i>Cost</i>
Observações	Job in Consortium	<i>Notes</i>

GNL - 3Z Project – Construção do Cais de Serviço
Porto de Arzew, Argélia**GNL – 3Z Project – Service Quays Construction**
Arzew Port, Algeria**Trabalhos Efectuados**

Os trabalhos de construção dos cais de serviço do projecto GNL-3Z, em Arzew, Argélia, foram executados por um consórcio de que a Seth fez parte.

Esta obra consistiu na construção de 2 cais constituídos por colunas de aduelas de betão armado, encabeçadas por uma viga de coroamento, também em betão armado.

Estes dois novos cais acostáveis, com fundos de serviços à cota -9.50 m (Z.H.), têm 85 m e 35 m de comprimento, respectivamente e serão usados pelas embarcações de dragagem, rebocadores e outras embarcações de apoio no desenvolvimento dos trabalhos do projecto GNL-3Z no Porto de Arzew.

Principais quantidades

Aduelas em betão armado – 160 un

Betão armado em aduelas – 1.200 m³

Betão armado em superestrutura - 450 m³

Dragagens - aprox 9 628 m³

Enrocamentos diversos – 5.000 m³

**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 units

Reinforced concrete staves - 1,200 m³

Reinforced concrete superstructure - 450 m³

Dredging - + - 9628 m³

Armourstone - 5,000 m³

**Resumo da Obra****Work Summary**

Cliente	Snamprogetti Chyoda s.a.s. di SAIPEM S.p.A.	<i>Client</i>
Tipo de contrato	Valor Global	<i>Contract type</i>
Data de construção	2009	<i>Construction period</i>
Custo	EUR 2.600.000,00	<i>Cost</i>

Porto de Recreio de Oeiras

Oeiras

Oeiras Pleasure Harbour

Oeiras, Portugal

Trabalhos efectuados

Obra estruturante para o concelho de Oeiras, não só requalifica a orla ribeirinha como se assume um espaço de lazer, de desporto e de apoio às actividades náuticas, com uma área envolvente com cerca de 250 lugares de estacionamento automóvel, um lote de lojas e um restaurante, instalações para a PSP e para o SEF, sanitários públicos e um posto de abastecimento de combustíveis para barcos.

A marina inserida no Porto de Recreio de Oeiras disponibiliza assim 275 lugares para embarcações de 6 a 25 m de comprimento.

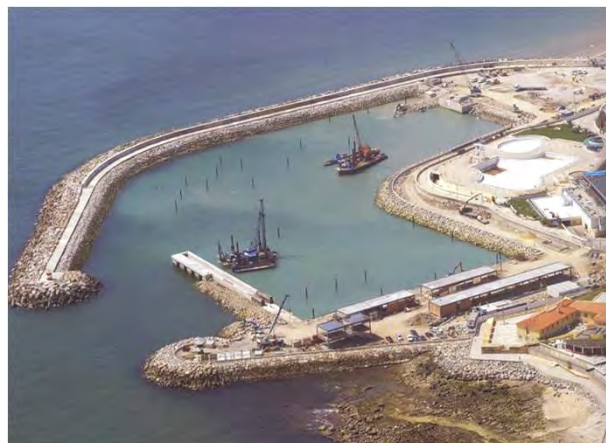
Work description

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.

Principais volumes de trabalho

Main work volumes

Betão / Concrete, 4 000 m³
Estrutura metálica / Steel Structure, 165 000 Kg
Estacas em betão Ø300mm / Foundation piling, 48 units
Estacas metálicas Ø580 mm / Steel piles, 49 units
Passadiços flutuantes / Steel gangways w/ wood, 1400 m²
Pavimentos / Concrete pav. vessel parking area, 4269 m²
Rev. betuminoso / Bituminous concrete pavement, 2142 m²



Resumo da Obra

Work Summary

Cliente	Câmara Municipal de Oeiras	<i>Client</i>
Tipo de contracto	Concepção / Construção	<i>Contract type</i>
	Design-build	
Construtores	Seth, SA (em consórcio)	<i>Construction consortium</i>
Data de construção	2004-2005	<i>Construction period</i>
Custo	€ 7.000.000,00	<i>Cost</i>

Terminal Multiusos de Leixões
Porto de Leixões
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 tones**
 NOREF type quay mass concrete blocks - **1,546 units**


Work Summary

Client	APDL Administração dos Portos do Douro e Leixões
Type of contract	Lump Sum
Contractor:	Seth, SA (in consortium)
Construction period	2006-2009
Cost	EUR 13.000.000,00

Terminal de Cruzeiros de Lisboa – 1.ª fase
Santa Apolónia, Lisboa
Lisbon Cruise Liner Terminal - 1st Stage
Santa Apolónia, Lisboa
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 6,600 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)


Resumo da Obra
Work Summary

Cliente	APL	Client
	Administração do Porto de Lisboa	
Tipo de contrato	Valor Global	Contract type
Data de construção	2007-2009	Construction period
Custo	EUR 14.000.000,00	Cost

Terminal de Cruzeiros de Lisboa – 2.^a fase
Santa Apolónia, Lisboa
Lisbon Cruise Liner Terminal – 2nd Stage
Santa Apolónia, Lisboa
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 - +- 65,000 m³

Precast beams – 513 units (556,000 kg of rebar cages and 2,405 m³ of concrete)

Precast slabs – 1,327 units (438,000 kg of rebar cages and 2,587 m³ of concrete)


Resumo da Obra
Work Summary

Cliente	APL	Client
	Administração do Porto de Lisboa	
Tipo de contrato	Valor Global	Contract type
Data de construção	2009-2011	Construction period
Custo	EUR 38.200.000,00	Cost

**Grande Reparação do Molhe Principal
do Porto de Porto Santo**
Porto Santo (Arquipélago da Madeira)
***Major Repair of the Main Breakwater
of the Port of Porto Santo***
Porto Santo (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 repurfiling the external protection of the breakwater, (East section) consisting of rockfill of up to 0.15 tonnes 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: 4,000 units

10-tonne tetrapods (new): 350 units

10-tonne tetrapods (existing,
dismantled and reapplied): 5,000 units

C35/45 concrete: 52,000 m³

Rockfill 2/3 ton: 85,000 ton

Dredging sand: 25,000 m³


Resumo da Obra
Work Summary

Cliente

**APRAM - Administração do Portos
da Região Autónoma da Madeira, S.A.**

Tipo de contrato

Valor Global

Data de construção

2007-2009

Custo

EUR 19.000.000,00

Contract type

Construction period

Cost

Terminal de Granéis Sólidos do Porto de Aveiro

Gafanha da Nazaré, Aveiro

Bulk Terminal, Aveiro Harbour

Gafanha da Nazaré, Aveiro

Descrição dos trabalhos

Este é o primeiro cais de acostagem em Portugal, construído em cortinas de estacas-prancha ancoradas. A parede que suporta o cais do Terminal de Granéis Sólidos de Aveiro foi construída numa combinação de estacas-prancha tipo Arcelor HZ 975 B –14 / AZ18. Os elementos-chave desta estrutura são perfis “HZ” com 25.9 m de comprimento, em aço da classe S 430 GP. Os elementos intermédios da cortina são estacas-prancha AZ18 com 20.9 m de altura, em aço da classe S 355 GP.

O âmbito dos trabalhos incluiu

- Construção de 750 metros de cais industrial;
- Construção de um terrapleno com 22 000m² de superfície e um caminho de rolamento, fundado em 642 estacas, cada uma com 1000 mm de diâmetro.
- 4 500 toneladas de estacas-prancha.



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.



Resumo da Obra

Work Summary

Cliente
Tipo de contrato

APA – Administração do Porto de Aveiro, SA
Série de Preços
Unit Prices
2001-2004
EUR 21.038.183,00
Obra feita em Consórcio
Job in Consortium

Client
Contract type

Data de construção
Custo
Observações

Construction period
Cost
Notes

Porto de Fuah Mulaku

República das Maldivas

Fuah Mulaku Harbour

Republic of Maldives

Trabalhos efectuados

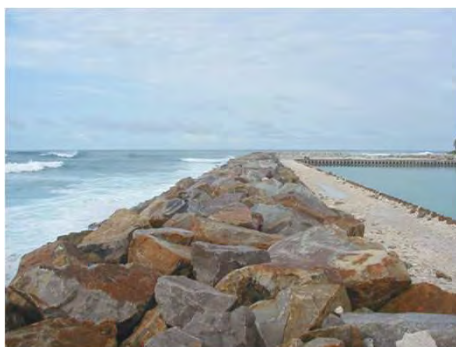
Construção de um porto de pesca com uma área total de 15 000 m², incluindo 500 m de parede quebra-mar, 700 m de estacas-prancha e dragagem de aproximadamente 80 000 m³ de fundos de coral de elevada dureza.

A cravação das estacas-prancha e a execução dos trabalhos de dragagem exigiu o desmonte a fogo dos terrenos subjacentes através de 85 toneladas de explosivos.

As paredes quebra-mar foram construídas com pedra de granito importada (cerca de 50 000 toneladas).

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.



Topo: aspecto, após a conclusão
Top: view, after completion

Imagens inferiores: durante a construção
Lower images: work in progress

Resumo da Obra

Work Summary

Cliente	Ministry of Construction and Public Works	<i>Client</i>
Construtores	Højgaard & Schultz a/s SETH, Lda.	<i>Construction consortium</i>
Data de construção	2000-2002	<i>Construction period</i>
Custo	€ 9,7 million	<i>Cost</i>

Reparação de Emergência do Quebra-Mar – Fase 1

Puerto Militar – Praia da Vitória, Açores

Breakwater Emergency Repair – Stage 1

POL Pier – Praia da Vitória, Azores

Trabalhos realizados

Cota do coroamento: (+7:00 ZH)

Cota do pé do talude: (- 8:00 ZH)

Fabrico e colocação de antiferes de 20 tons: 415 unid.

Fabrico e colocação de CORE-LOC® de 33 tons: 380 unid.

Enrocamento de 2 a 9 tons: 5.500 tons

NOTA:

Os maiores CORE-LOCS® do mundo à data desta obra.

Maquinaria utilizada

1 Grua de rastos de 350 tons

1 Grua de rastos de 250 tons

1 escavadora giratória de 60 tons

3 trailers de 40 tons

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.

Armour rock (2 - 9 ton): 5500 tons

Equipment used

1 Crawler crane, 350 tons

1 Crawler crane, 250 tons

1 Hydraulic excavator, 60 tons

3 trailers, 40 tons



Topo: aspecto da zona dos trabalhos

Top: site, general view

Imagens inferiores: CORE-LOC e antifers
Lower images: CORE-LOC unit and antifers



Resumo da Obra

Work Summary

Cliente	Brown & Root Services Corp. (US Navy)	Client
Consórcio com	Ediçor/Somague	In consortium with
Projectista	Transystems Corporation	Engineering
Data de construção	2002 - 2003	Construction period
Custo	€ 12,6 million (Phase I)	Cost

Reparação de Emergência do Quebra-Mar, Fase 2

Puerto Militar – Praia da Vitória, Açores

Breakwater Emergency Repair, Stage 2

POL Pier – Praia da Vitória, Azores

Trabalhos realizados

Cota do coroamento: (+7:00 ZH)
 Cota do pé do talude: (- 10:00 ZH)
 Fabrico e colocação de CORE-LOC®
 de 33 tons: 670 unid
 Enrocamento de 2,5 a 20 tons:
 175.500 tons

NOTA: Os maiores CORE-LOCS®
 do mundo à data desta obra.

Maquinaria utilizada

1 Grua de rastos de 350 tons
 1 Grua de rastos de 250 tons
 1 escavadora giratória de 60 tons
 3 trailers de 40 tons
 1 pá carregadora Komatsu WA600 (60T)



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)



Topo: aspecto da zona da obra
 Top: site, general view

Resumo da Obra

Work Summary

Cliente	Brown & Root Services Corp. (US Navy)	<i>Client</i>
Projectista	Transystems Corporation	<i>Engineering</i>
Data de construção	2004 - 2006	<i>Construction period</i>
Custo	€ 24,6 million (Phase 2)	<i>Cost</i>

Reparação de Emergência do Quebra-Mar – Fase 3

Porto Militar – Praia da Vitória, Açores

Emergency Repair of the Breakwater – Stage 3

Military Port, POL Pier – Praia da Vitória, Azores

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 (60 ton)



Resumo da Obra

Work Summary

Cliente	US Navy	<i>Client</i>
	United States Navy	
Projectista	Baird & Associates (USA)	<i>Engineering</i>
Data de construção	2007 - 2009	<i>Construction period</i>
Custo	€ 8,5 million (Phase 3)	<i>Cost</i>

Porto de Abrigo da Costa Norte no Porto Moniz

Porto Moniz, Madeira

Porto Moniz Harbour

Porto Moniz. Madeira

Trabalhos efectuados

- Construção de cais acostável
- Caixotões fundados à cota – 8,00m ZH
- Viaduto em betão armado para acesso ao porto.

Volumes de trabalho

Fabrico e colocação de 2100 antifers com 50 toneladas cada

- 5 caixotões com 25m x 15m x 13m cada
- 200.000 m³ de enrocamentos

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*



Resumo da Obra

Work Summary

Cliente
Fiscalização
Tipo de contrato

APRAM (Madeira)
APRAM
Série de Preços
Unit Price
2002-2003
EUR 18.352.751
WW – Consultores de Hidráulica
Consórcio com Etermar e Somague

Client
Inspection agency
Contract type

Data de construção
Custo
Projectista
Observações

Construction period
Cost
Architect/Engineer
Notes

U.S. Navy - Cais de Combustíveis e Lubrificantes

Terceira, Açores

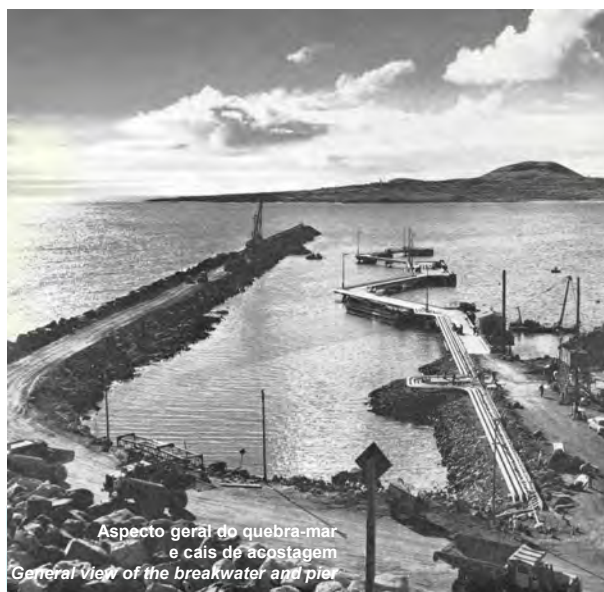
U.S. Navy - POL Pier

Terceira Island, Azores

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.



Resumo da Obra **Work Summary**

Cliente	U.S. Navy	Client
Fiscalização	Naval Facilities Engineering Command	Inspection agency
Tipo de contrato	Construção	Contract type
	Construction Only	
Data de construção	1962-1963	Construction period
Volume de betão	75 000 m³	Total concrete volume
Estacas cravadas	40 m comp./length	Driven piles
Quebra-mar	650 m / 500 000 m³	Breakwater
Cais de acostagem	260 m	Pier
Calado útil	12 m	Draught

EXPO'98 - Dique de Fecho e Eclusa

EXPO'98 - Closure Dyke and Lock

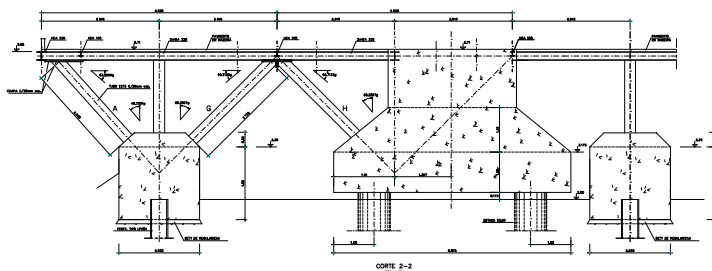


Ensecadeira da eclusa
Lock cofferdam

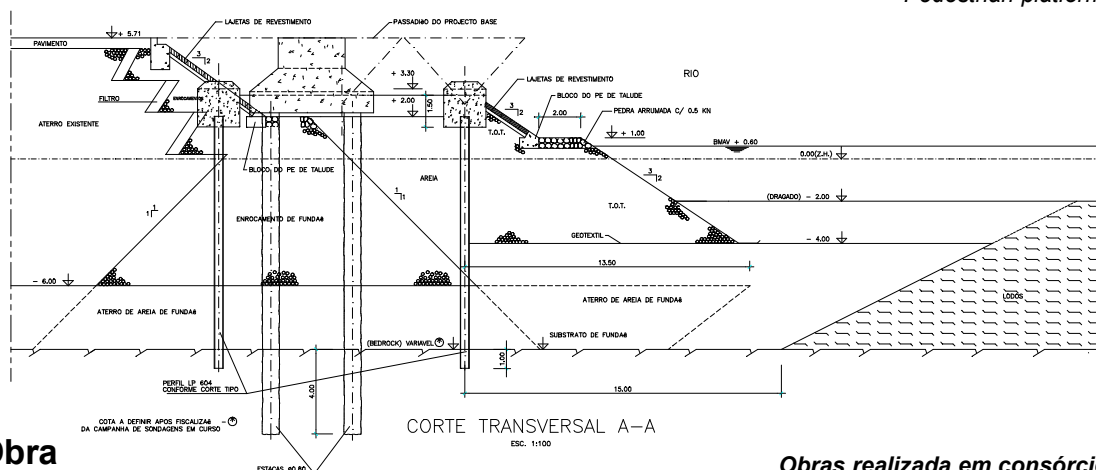


Description of works

- 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



Plataforma pedonal
Pedestrian platform



Resumo da Obra

Work Summary

Obras realizada em consórcio
Joint-venture works

Cliente
Tipo de contrato

Parque EXPO, SA
Chave-na-Mão
Turn-Key

Client
Contract type

Data de construção
Custo

1998
PTE 3.200.000.000

Construction period
Cost

Portinho de Pesca da Arrifana

Obras de Conservação e Valorização

Arrifana Fishing Harbor

Maintenance and Upgrading Works

Trabalhos efectuados

Dragagem da bacia interior
 Prolongamento e alteamento do quebra-mar
 Melhoramento da estabilidade das arribas
 Construção de muros de suporte da envolvente da bacia
 Reparação da rampa varadoura

Volume de betão: 2500 m³

Volume de enrocamento: 6000 m³



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*

Concrete volume: 2500 m³

Armor stone volume: 6000 m³



Topo: aspecto, após a conclusão
 Top: view, after completion

Imagem inferior:
 durante a construção
 Lower image:
 work in progress

Resumo da Obra

Work Summary

Cliente	Instituto de Conservação da Natureza	Client
Projectista	Consulmar	Designer / Engineer
Inspecção	Instituto Marítimo e Portuário	Inspection Agency
Tipo de contrato	Série de Preços	Contract type
	Unit Prices	
Data de construção	1999/2000	Construction period
Custo	€ 545.000	Cost

Ampliação do Cais de Descarga de Combustível

Central Termoelétrica do Carregado

Fuel Pier Extension

Carregado Power Plant

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.



Estacas, encabeçamentos e passadiços metálicos (em cima)
 Cais acostável durante a fase da sua construção (em baixo)
Piles and capping structures and steel structures (top view)
Berthing Quay during construction phase (bottom view)

Resumo da Obra

Work Summary

Cliente	EDP	<i>Client</i>
Projecto	Electricidade de Portugal, SA	
Projecto do sistema	Proman / SETH	<i>Engineering design</i>
de prevenção de derrames		<i>Oil spill prevention</i>
Fiscalização	Slickbar, Inc.	<i>design</i>
Tipo de contrato	EDP	<i>Inspection agency</i>
	Chave-na-Mão	<i>Contract type</i>
	Turn-Key	
Data de construção	1993	<i>Construction period</i>
Custo	PTE: 290.000.000	<i>Cost</i>
Estacas tubulares	Ø 500 / Ø 700	<i>Tubular piles</i>

Projecto Fénix - Ampliação do Cais 3

Lisnave Internacional, SA

Phoenix Project - Pier 3 Extension

Lisnave Internacional, SA

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 $\varnothing$ 1000 mm
 69 piles of $\varnothing$ 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.



Aspecto dos trabalhos de ampliação do Cais 3
 General view of the Pier 3 Extension works

Resumo da Obra

Work Summary

Cliente	Lisnave Int'l, SA	<i>Client</i>
Projecto	Imoconsult	<i>Engineering design</i>
Fiscalização	Proman	<i>Inspection agency</i>
Tipo de contrato	Chave-na-Mão	<i>Contract type</i>
	Turn-Key	
Data de construção	1995 - 1996	<i>Construction period</i>
Custo	PTE: 526.000.000	<i>Cost</i>
Volume de dragagens	120 000 m³	<i>Total dredging volume</i>
Volume de betão	6200 m³	<i>Total concrete volume</i>
Estacas moldadas	36 + 69	<i>Bored cast-in-place piles</i>
	(1000 mm - 800 mm)	
Prismas de enrocamento	18 000 m³ (3-5 ton)	<i>Armour stone</i>
Duque d'alba	14 x 7 x 10 m	<i>Dolphin</i>

Construção de Rampa e Cais de Apoio

Clube Náutico de Tavira

Construction of Ramp and Ancillary Quay

Tavira Nautical Club

Trabalhos efectuados

Construção de rampa varadouro
e cais de apoio

Estacas cravadas: Ø 508 mm, 22 unidades



Work description

Construction of a boats ramp
and ancillary quay

Driven steel piles: Ø 508 mm, 22 ea.



Topo: aspecto, após a conclusão
Top: view, after completion

Imagem inferior: durante a construção
Lower image: work in progress

Resumo da Obra

Work Summary

Cliente
Inspeção
Tipo de contrato

Câmara Municipal de Tavira
Câmara Municipal de Tavira
Série de Preços
Unit Prices

Client
Inspection Agency
Contract type

Data de construção
Custo

1999
€ 361.000

Construction period
Cost