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 169.6 m and a breadth of 1705 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**	*Client*
Tipo de contrato	**Lump Sum**	*Contract type*
Data de construção	**2015-2016**	*Construction period*
Custo	**EUR 12.401.909,85**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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 m^3

Concrete blocks, caissons: 7,200 m^3

Concrete in curtain wall: 10,000 m^3

Rockfill, quarry-run: 320,000 m^3

Rockfill underwater: 66,000 m^3

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	**2009-2012**
Cost	**€ 26.319.577,00**

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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.**	*Client*
Tipo de contracto	**Valor Global / *Lump-sum***	*Contract type*
Construtores	**Seth, SA**	*Contractor*
Data de construção	**2015-2016**	*Construction period*
Custo	**€ 548.523,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Execução de Tomada de Água

Central de Ciclo Combinado de Lares (Figueira da Foz)

Water Intake and Discharge Pipping

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

Trabalhos Efectuados

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

Resumo da Obra
Work Summary

Cliente	**EDP – Energias de Portugal, SA**	*Client*
Tipo de contrato	**Valor Global** ***Lump Sum***	*Contract type*
Data de construção	**2008-2009**	*Construction period*
Custo	**EUR 2.990.000,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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** **Empresa Nacional de Combustíveis, SA**	*Client*
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*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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.

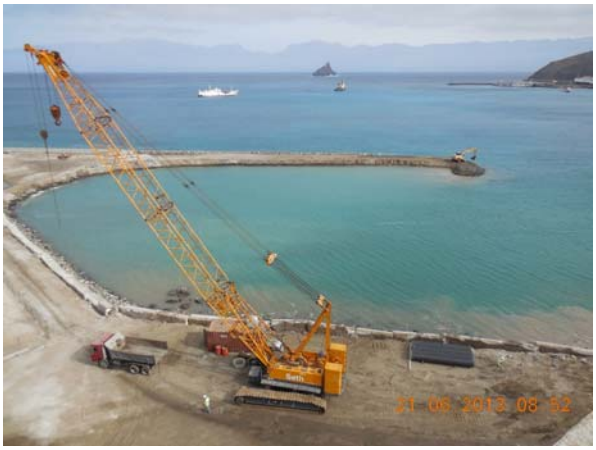
As far as Laginha is concerned, it was a beach about 300m long by 20m wide on average at the start of the job, its entire width sloping down to the sea.

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**	*Client*
Tipo de contracto	**Valor Global / *Lump-sum***	*Contract type*
Construtores	**Seth, SA (in Consortium)**	*Contractor*
Data de construção	**2013-2014**	*Construction period*
Custo	**€ 14.309.000,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Ampliação do Molhe Norte
Gilbraltar

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 backoe and a pontoon.

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

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)	*Client*
Tipo de contracto	**Valor Global / *Lump-sum***	*Contract type*
Construtores	**Seth, SA (em consórcio)**	*Contractor*
Data de construção	**2014-2015**	*Construction period*
Custo	**€ 11.750.000,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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 sitú 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**	*Client*
Tipo de contrato	**Preço global** ***Lump sum***	*Contract type*
Data de construção	**2013-2014**	*Construction period*
Custo	**426.000,00 EUR**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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	**Companhia Mineira do Lobito**	*Client*
Tipo de contrato	***Concepção-Construção Design-Build***	*Contract type*
Data de construção	**1968 - 1972**	*Construction period*
Estacas cravadas	**43 m comp./*lenght***	*Driven piles*
Cais de acostagem	**600 m**	*Berthing pier*
Navios servidos	**300 000 tdw**	*Ships served*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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	**Câmara Municipal de Lisboa**	*Client*
Tipo de contrato	**Série de preços**	*Contract type*
Data de construção	**Fev 2012 – Mar 2013**	*Construction period*
Custo	**EUR 3.750.000,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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 happer suction dredger in the dock of PAENAL shipyard of Porto Amboim

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Terminal de Exportação de Clinquer 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 de terra do cais de acostagem
Berthing pier viewed from land

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.

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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**	*Client*
Tipo de contrato	**Lump Sum**	*Contract type*
Data de construção	**2011-2012**	*Construction period*
Custo	**EUR 18.000.000,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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	**NovaCimangola**	*Client*
Tipo de contrato	**Preço global** ***Lump sum***	*Contract type*
Data de construção	**2003-2004**	*Construction period*
Custo	**USD 2.200.000,00**	*Cost*
Projectista	**Eng. Luís Colen**	*Designer*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

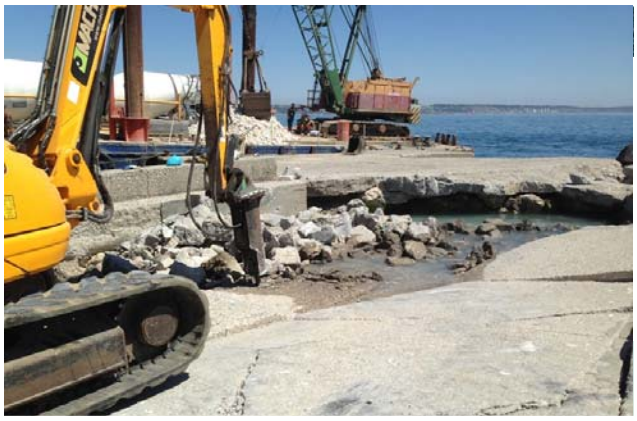
Reparação da Loca do Farol do Bugio
Foz do Rio Tejo – Zona de Oeiras (Lisboa)

Repair of the Void at Bugio Lighthouse
Mouth of the Tagus River – Zone of Oeiras, Lisbon

Work description

Seth has fulfilled the contract for the repair of the Void at the Bugio Lighthouse under Directorate of Lighthouses management.
This job called for the repair and filling of the void to prevent deterioration of the entire berthing and access area.
The Bugio Lighthouse is a work of military architecture situate at the mouth of the Tagus, specifically on the Cabeça Seca sandbank in front of Oeiras and São Julião da Barra.
The construction of this listed building dates from the nineteenth century and it consists of a two-storey circular tower, each floor separated by a moulding, with few openings.
In the central area of the fort, in the middle of the parade ground, stands the Bugio Lighthouse.

Fort "São Lourenço do Bugio/Bugio Lighthouse
(Photo by Daniel Feliciano / pt.wikipedia.org)



Repair of the void at the Bugio Lighthouse
(Photo by Manuel Garcia)

View of the works
(Photo by Manuel Garcia)

Equipment employed

• 1 30m x 9m pontoon with a draught of 2.3 m, equipped with winches and piles
• 2 x 365 HP tugs, 16.5m x 4m, with a draught of 1.68m
• 1 x 6m launch, with a 40HP engine
• 1 Crawler crane of 60T capacity, installed on the pontoon
• 3 fixed concrete kibbles with pump
• 1 crawler excavator equipped with a hydraulic hammer
• Concrete mixers and ready-mix concrete pump
• Formwork Panels
• Concrete Vibrator
• 1 Pick-up Truck
• 1 x 3-axle truck equipped with HIAB crane
• 2 light vehicles

Main quantities

400m3 of C30/37.S4XC2(P).D22.C10.4(CPF) concrete
25m3 Calibrated Rockfill
1 roll of geotextile

Resumo da Obra
Work Summary

Cliente	**Ministério da Defesa Nacional** **MARINHA - Direcção de Infraestruturas**	*Client*
Tipo de contrato	**Preço Global**	*Contract type*
Data de construção	**2013**	*Construction period*
Custo	**EUR 134.000,00**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Trabalhos de reforço do molhe exterior do Porto de Oran

Argélia

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

Oran, Algerie

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 extenção de 1287 m.
Foi construída uma banqueta 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 atè 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** Argélia / **Algerie**	*Client*
Tipo de contrato	**Preço global / *Lump sum***	*Contract type*
Data de construção	**2007-2010 (27 mois)**	*Construction period*
Custo	**EUR 35.176.600,00**	*Cost*
Observações	***Job in Consortium***	*Notes*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Reabilitação do Molhe Leste do Porto Petrolífero de Béjaia

Béjaia, Argélia

Rehabilitation of East Breakwater of the Oil Port of Béjaia

Béjaia, Algerie

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 m^3

Betão em blocos: 20.434 m^3

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 m^3

Concrete blocks: 20,434 m^3

Resumo da Obra
Work Summary

Cliente	**Ministère des Travaux Publics de l'Republique 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*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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 m^3
Betão armado em superestrutura - 450 m^3
Dragagens - aprox 9 628 m^3
Enrocamentos diversos – 5.000 m^3

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 I 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 m^3
Reinforced concrete superstructure - 450 m^3
Dredging - + - 9628 m^3
Armourstone - 5,000 m^3

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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, Algerie

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 superstrutura de betão *in-situ*.

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*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Construção de um Cais no Porto Petrolífero de Béjaia

Béjaia, Argélia

Construction of a Quay in the Oil Port of Béjaia

Béjaia, Algerie

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 m^3
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 m^3
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	**SOGEPORTS** **Entreprise Portuaire de Béjaia, EPE**	*Client*
Tipo de contrato	**Preço global / Lump sum**	*Contract type*
Data de construção	**2008-2009 (11 mois)**	*Construction period*
Custo	**EUR 11.146.000,00**	*Cost*
Observações	***Job in Consortium***	*Notes*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Porto de Recreio de Oeiras

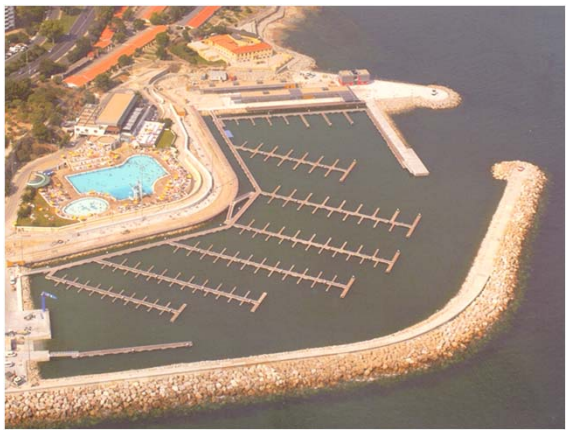
Oeiras

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 áera 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 m^3
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 m^2
Pavimentos / Concrete pav. vessel parking area, 4269 m^2
Rev. betuminoso / Bituminous concrete pavement, 2142 m^2

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Plataforma de aterro e taludes de protecção em Koudiet Eddraouch

Annaba, Argélia

Platform landfill and protective embankments at Koudiet Eddraouch

Annaba, Algerie

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 m^3
Núcleo de enrocamento seleccionado: 13.775 m^3
Tela geotêxtil: 8.024 m^2
Filtro de enrocamento 3-5 kg: 1.881 m^3
Filtro de enrocamento 500-700 kg: 11.252 m^3
Manto de enrocamento 5-7 ton: 20.742 m^3

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 m^3
Selected core rockfill: 13,775 m^3
Geotextile fabric: 8,024 m^2
Filter rockfill 3-5 Kg: 1,881 m^3
Filter rockfill 500-700 Kg: 11,252 m^3
Cloak rockfill 5-7 ton: 20,742 m^3

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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, Algerie

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 m^3
Enrocamentos: 54.760 m^3
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 m^3
Rockfill: 54.760 m^3
Sheet piles AZ50: 1.430 ton

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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**
Dreading 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**

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Terminal de Cruzeiros de Lisboa – 1.ª fase
Santa Apolónia, Lisboa

Lisbon Cruise Liner Terminal - 1st Stage
Santa Apolónia, Lisboa

Work perfomed

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

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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, construido em cortinas de estacas-prancha ancoradas.
A parede que suporta o cais do Terminal de Granéis Sólidos de Aveiro foi construida 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

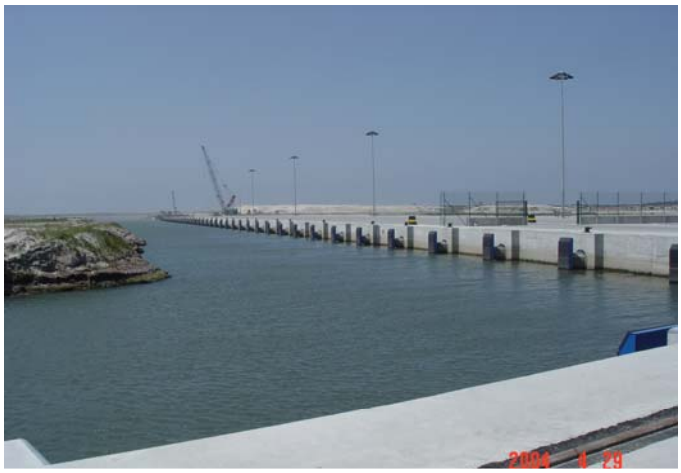
- Construção de 750 metros de cais industrial;
- Construção de um terrapleno com 22 000m^2 de superfície e um caminho de rolamento, fundado em 642 estacas, cada uma com 1000 mm de diâmetro.
- 4 500 toneladas de estacas-prancha.

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 lenght 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 m^2 and a gantry rail supported by 642 concrete piles (Ø 1000 mm).
- 4 500 ton of sheet-piles.



Resumo da Obra
Work Summary

Cliente	**APA – Administração do Porto de Aveiro, SA**	*Client*
Tipo de contrato	**Série de Preços**	*Contract type*
	Unit Prices	
Data de construção	**2001-2004**	*Construction period*
Custo	**EUR 21.038.183,00**	*Cost*
Observações	**Obra feita em Consórcio**	*Notes*
	Job in Consortium	

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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 m^3
Volume de enrocamento: 6000 m^3

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 m^3
Armor stone volume: 6000 m^3

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** ***Unit Prices***	*Contract type*
Data de construção	**1999/2000**	*Construction period*
Custo	**€ 545.000**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Terminal de Cruzeiros de Lisboa – 2.ª fase
Santa Apolónia, Lisboa

Lisbon Cruise Liner Terminal – 2nd Stage
Santa Apolónia, Lisboa

Work perfomed

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

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Estacas de Guiamento dos Pontões

Plataforma Avançada e de uma Retenção Marginal
Interface do Cais do Sodré, Lisboa

Guiding Piles for Floating Pontoons

Dettached Platform and Bank Retention
Cais do Sodré Transit Interface, Lisbon

Fornecimento de estacas para guiamento dos pontões, criação de uma plataforma avançada e de uma retenção marginal no Interface do Cais do Sodré, na cidade de Lisboa.

O âmbito dos trabalhos incluiu:

- Dragagem e demolição
- Enrocamentos e assentamentos de pedras para reforço e revestimento do perret
- Execução de estacas moldadas no terreno
- Cravação de estacas metálicas
- Betão armado

Work Description

- Guiding piles for floating pontoons
- Dredging and demolition works
- Supply and placing of armour stones
- Concrete piles (casting in-situ)
- Reinforced concrete works

Vista geral das estacas de guiamento.
General view of piling to guide floating pontoons

Resumo da Obra
Work Summary

Cliente	**Metropolitano de Lisboa**	*Client*
Tipo de contrato	**Concepção-Construção**	*Contract type*
	Design-Build	
Data de construção	**2002-2003**	*Construction period*
Custo	**EUR: 2.424.619,00**	*Cost*
Classificação	**RINAVE**	*Classification*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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**	*Client*
Construtores	**Højgaard & Schultz a/s SETH, Lda.**	*Construction consortium*
Data de construção	**2000-2002**	*Construction period*
Custo	**€ 9,7 million**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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)

Works Performed

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 34º and their replacement by 30-tonne antifers, laid with an inclination of about 26º. 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**	*Contract type*
Data de construção	**2007-2009**	*Construction period*
Custo	**EUR 19.000.000,00**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Pontões de Acostagem Flutuantes e Pontes de Acesso

Interface do Cais do Sodré, Lisboa

Floating Berthing Pontoons and Access Gangways

Cais do Sodré Interface, Lisbon

Fornecimento completo de 3 pontões flutuantes para embarque e desembarque dos passageiros da carreira fluvial Lisboa-Cacilhas, integrados no Interface do Cais do Sodré.

O âmbito dos trabalhos incluiu:

- Construção de 3 pontões flutuantes
- Construção de 6 passadiços de acesso cobertos
- Lastragem e aprestamento dos pontões
- Licenciamento da construção junto da Autoridade Marítima

O lançamento à água teve lugar no cais dos estaleiros da Mitrena, em Setúbal, tendo sido utilizado o pórtico rolante. Os pontões foram depois rebocados até ao local de montagem definitivo, onde se procedeu ao seu posicionamento e ancoragem.

Vista geral de um dos postos de acostagem.
General view of one of the berthing pontoons for the Lisbon-Cacilhas ferry line.

Work Description

Complete furnishing of 3 floating pontoons for ferry boat line passengers (Lisbon-Cacilhas line).

Work included:
- Construction of 3 floating pontoons
- Construction and erection of 6 covered gangways
- Ballasting and rigging of pontoons
- Licencing/classification of the pontoons

Launching of the pontoons took place at the Mitrena, Setubal shipyard and were then towed to their final destination location and moored.

Resumo da Obra
Work Summary

Cliente	**Metropolitano de Lisboa**	*Client*
Tipo de contrato	**Concepção-Construção**	*Contract type*
	Design-Build	
Data de construção	**2003**	*Construction period*
Custo	**EUR 2.490.303,00**	*Cost*
Classificação	**RINAVE**	*Classification*
Pontões:	**3 unid. / *units***	*Pontoons:*
Comprimento	**38,5 m**	*Length overall*
Boca	**10,0 m**	*Beam*
Pontal	**2,5 m**	*Moulded depth*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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.

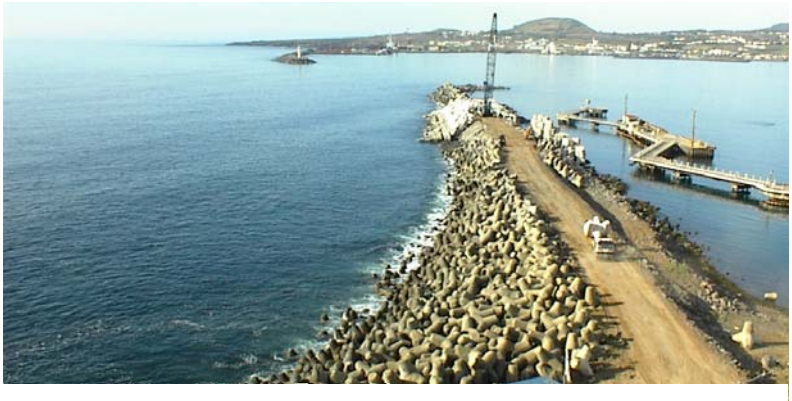
Maquinaria utilizada
1 Grua de rastos de 350 tons
1 Grua de rastos de 250 tons
1 escavadora giratória de 60 tons
3 trailers de 40 tons

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*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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)**	*Client*
Projectista	**Transystems Corporation**	*Engineering*
Data de construção	**2004 - 2006**	*Construction period*
Custo	**€ 24,6 million (Phase 2)**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

U.S. Navy - Cais de Combustíveis e Lubrificantes

Terceira, Açores

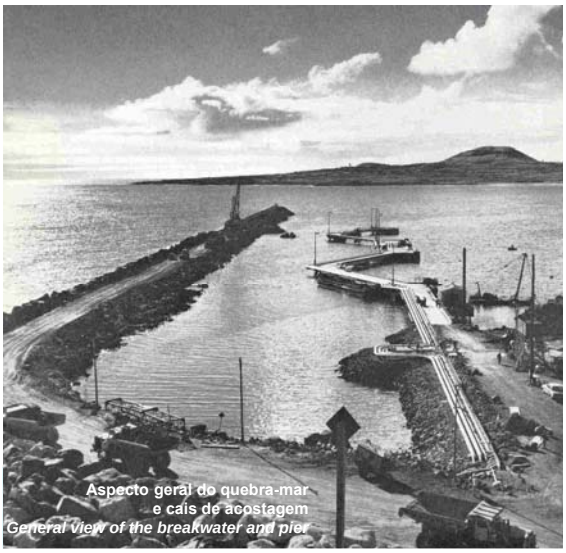
U.S. Navy - POL Pier

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.



Aspecto geral do quebra-mar e cais de acostagem
General view of the breakwater and pier

Resumo da Obra
Work Summary

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

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Projecto Fénix - Ampliação do Cais 3

Lisnave Internacional, SA

Phoenix Project - Pier 3 Extension

Lisnave Internacional, SA

The Extension of Pier # 3 of Shipyards at Lisnave (Setúbal) was performed in 2 phases:
• 53 x 18 m (Phase 1) and
• 15 x 14 m (Phase 2).

The new pier was supported on bored piles on the ground, in the following quantities and dimensions:
• 36 cuttings with Ø 1,000 mm
• 69 stakes Ø 800 mm

The dredging made were intended to improve navigation in the turning basin and deployment of the foundations of the structure of the pier.

The work also included the protection of buildings with prisms rockfill, several gutters fluid, construction of 1 dolphin and several works for recovery of Pier # 1.

The dolphin was erected on a shoe with 8 m x 15 m and joined a slab top with 14 m x 7 m.
The volume of sand for core filling totaled 900 m^3.

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

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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;
- Reprofiling 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** **United States Navy**	*Client*
Projectista	**Baird & Associates (USA)**	*Engineering*
Data de construção	**2007 - 2009**	*Construction period*
Custo	**€ 8,5 million (Phase 3)**	*Cost*

Avenida Tomás Ribeiro, n.º 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Construção das Infraestruturas da 2.ª fase do Porto de Peniche – 1.ª etapa

Peniche

Construction of the infrastructures of the 2nd Phase of the Port of Peniche – 1st Stage

Peniche (Portugal)

Work Perfomed

The construction of the infrastructures of the 2nd Phase of the Port of Peniche – 1st Stage, provided this new sector of the port with highway, sewage, water supply (fresh and sea water), electricity, communications and CCTV infrastructures. Besides these networks, there was also the buildings complex required for this sector of the port to come into operation, involving the construction of the new Guard House, the Mareograph Building and the the Provisional Fish Reception and Transfer Building.

The Provisional Fish Reception and Transfer Building comprises a steel hangar 125 m long with a current-construction (concrete and brickwork) services building at each end.

Work was also carried out on the Port's Pumping Station, involving replacement of the pumping equipment, pipework and accessories, and the internal and external painting of 5 hydro-pneumatic pressure vessels.

Attention is also drawn to the installation of a 16 m weighbridge and to the drilling of two water-abstraction boreholes and to three hydrocarbon separators for the water supply and drainage networks respectively.

Main Quantities:

Excavation – 34,600 3 m3
Concrete – 1,400 m3
Rebar cages – 72,000 kg
Pipework – 9,000 m
Concrete sett paving –16,000 m2
Bituminous paving – 23,500 m2
Fencing – 1,300 m

Resumo da Obra
Work Summary

Cliente	**IPTM – Instituto Portuário e dos Transportes Marítimos**	*Customer*
Tipo de contrato	**Indefinite-Quantities**	*Type of Contract*
Data de construção	**2007-2008**	*Construction period*
Custo	**EUR 3.505.294,30**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

Marinas de Recreio e Portos de Pesca Ligeira
Marinas and Light Fishing Harbours

Projecto, construção e fornecimento de equipamento flutuante de diversas marinas, portos de pesca para embarcações de reduzido calado e instalações turísticas aquáticas nas seguintes localidades:

- **Lisboa**
  Marina da Doca de Sto. Amaro
  Marina da Doca do Bom Sucesso
- **Estoril**
  Piscina Oceânica do Tamariz
- **Cascais**
- **Peniche, Setúbal, Sines, Pomarão, Faro e Carregal do Sul**
- **Lagos**
  Porto de Pesca

Design, construction and supply of floating equipment for various marinas, fishing harbours and waterside leisure facilities in the following sites:

- ***Lisboa***
  St. Amaro Dock Marina
  Bom Sucesso Dock Marina
- ***Estoril***
  Tamariz Ocean Pool
- ***Cascais***
- ***Peniche, Setúbal, Sines, Pomarão, Faro e Carregal do Sul***
- ***Lagos***
  Fishing harbor

Trabalhos típicos
Typical work

- Dragagens / *Dredging*
- Cravação de estacas / *Pile driving*
- Enrocamentos / *Rock riprap and armour stone*
- Águas e esgotos / *Water and sewer lines*
- Instalação eléctrica / *Electrical services*
- Passadiços de acesso / *Access gangways*

Quebra-mar destacado - Castelo do Neiva
Outlaying breakwater - Castelo do Neiva

Doca de Sto. Amaro - Lisboa
Vista aérea da marina
St. Amaro Dock - Lisbon
Aerial view of the marina

Lagos - Algarve
Porto de Pesca
Lagos – Algarve
Fishing Harbour

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
www.seth.pt

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 m^3 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: 200.00m^3*

Vista geral da obra (topo). Vista durante a construção (em baixo).
General view of the finished work (top). Construction in progress (below).

Resumo da Obra
Work Summary

Cliente	**APRAM (Madeira)**	*Client*
Fiscalização	**APRAM**	*Inspection agency*
Tipo de contrato	**Série de Preços** ***Unit Price***	*Contract type*
Data de construção	**2002-2003**	*Construction period*
Custo	**EUR 18.352.751**	*Cost*
Projectista	**WW – Consultores de Hidráulica**	*Architect/Engineer*
Observações	**Consórcio com Etermar e Somague**	*Notes*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
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Ampliação do Cais de Descarga de Combustível

Central Termoeléctrica do Carregado

Fuel Pier Extension

Carregado Power Plant

Description of work:

- Demolition of existing piles mooring (dolphins)
- Crimping of tubular piles Ø 500 and Ø 700.

- Prefabrication of structural elements (reinforced concrete).

- Construction and installation of steel structures (gangways connecting and fenders).

- Supply and installation of fenders.

- Design-build of spill prevention system, comprising:
  - Floating barriers;
  - Motor pump racking;
  - Flexible tanks;
  - Recovery discs.

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

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2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
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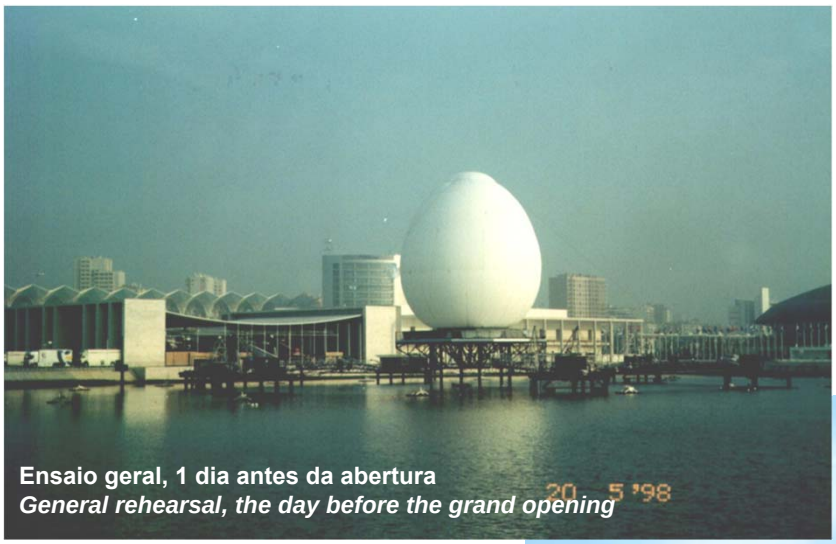
EXPO'98 AcquaMatrix
AcquaMatrix at EXPO'98



Ensaio geral, 1 dia antes da abertura
General rehearsal, the day before the grand opening

Cravação de estacas de suporte.

Fabricação, montagem e pinturas das estruturas metálicas para montagem dos equipamentos do espectáculo.

Desmontagem das estruturas e remoção das estacas.

Plataforma "Valeira"
"Valeira" jack-up platform

A demolição no fim da festa
The party was over: demolition works in progress

Resumo da Obra
Work Summary

Cliente	**ECA2**	*Client*
Tipo de contrato	**Chave-na-Mão**	*Contract type*
	Turn-Key	
Data de construção	**1998**	*Construction period*
Custo	**PTE: 240.000.000**	*Cost*
Estacas	**58 / ∅ 500 (12/16 m)**	*Driven piles*
Estruturas metálicas	**110 tons**	*Structural steel*

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2790-467 QUEIJAS - Portugal
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Remodelação da Doca - Carregal do Sul
Dock Remodeling - Carregal do Sul

Trabalhos efectuados

Fornecimento e instalação de um quebra-mar flutuante com um comprimento total de 140 m e largura mínima de 3 m.
Dragagens para obtenção de fundos à cota de -1,50 m ZH.
Reformulação do perímetro envolvente da doca com elevação do coroamento.
Construção de maciços de enraizamento do passadiço de acesso às embarcações.
Cravação de estacas de apoio e fornecimento e instalação dos passadiços flutuantes (cerca de 140 m) para amarração das embarcações.
Fornecimento e instalação de equipamento urbano diverso (candeeiros, bancos e canteiros).
Reconstrução dos pavimentos.

Work description

General dock remodeling, including dredging to -1,50 m, fabrication and installation of a floating breakwater (140 x 3 m) and floating walkways (total of 140 m) for 335 boats of various sizes. Refurbishing of the surrounding area, including the installation of urban equipment (lighting fixtures, benches and planters).

Após a remodelação efectuada, a doca pode agora receber 335 embarcações.
After this remodelation, the dock has now the capacity to lodge 335 boats.

Resumo da Obra
Work Summary

Cliente	**Instituto Marítimo- Portuário**	*Client*
Projectista	**Instituto Marítimo- Portuário**	*Designer / Engineer*
Tipo de contrato	**Chave-na-Mão**	*Contract type*
	Turn-Key	
Data de construção	**Jan/Dez2000**	*Construction period*
Custo	**PTE 455.000.000**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
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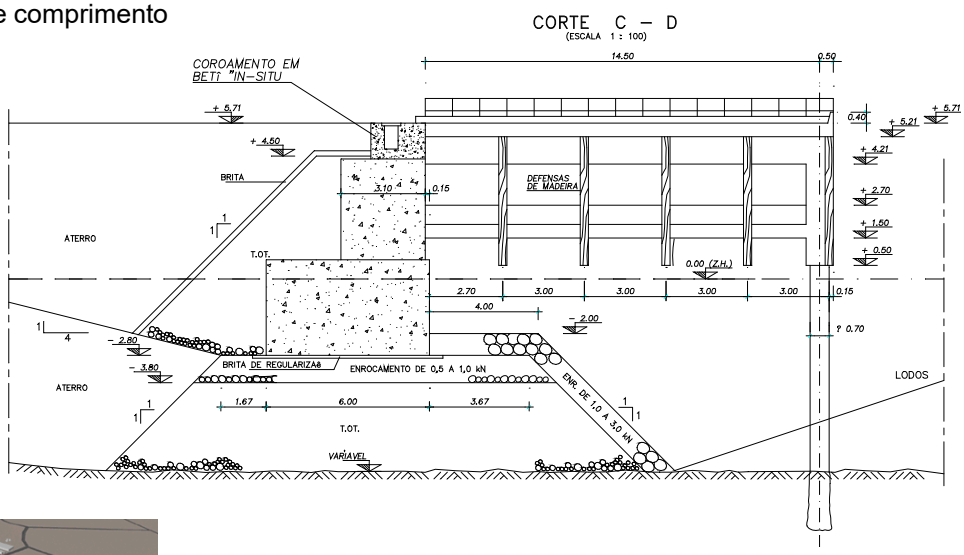
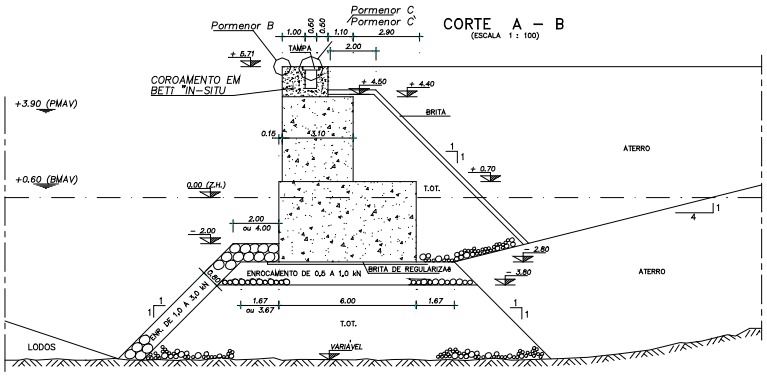
EXPO'98 - Cais da Marina
EXPO'98 - Marina Quay

Descrição dos Trabalhos
Work Description

- Terrapleno / *Earthfill* - 30 000 m^3
- Betão subaquático / *Underwater concrete* - 6400 m^3
- Cais / *Quay* - 200 m de comprimento



Localização
Work site



Resumo da Obra
Work Summary

Obras realizada em consórcio
Joint-venture works

Cliente	**Parque EXPO, SA**	*Client*
Tipo de contrato	**Chave-na-Mão**	*Contract type*
	Turn-Key	
Data de construção	**1998**	*Construction period*
Custo	**PTE 500.000.000**	*Cost*

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2790-467 QUEIJAS - Portugal
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Quebra-mar Destacado, Castelo do Neiva
Outlaying Breakwater, Castelo do Neiva

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

Imagens inferiores: diversos aspectos, durante a construção
Lower images: views during construction

Trabalhos efectuados

Construção de um quebra-mar destacado em betão simples, para protecção da entrada e saída de embarcações de pesca. Assentamento do paredão sobre formações rochosas, após quebramento e regularização por explosivos. Protecção do manto exterior com enrocamento.

Comprimento: 250 m
Cota do coroamento: +6.00 ZH
Volume de betão: 6430 m^3
Volume de enrocamento: 25 000 ton.
Desmonte e dragagem de rocha: 5850 m^3

Work description

Construction of a non-reinforced concrete outlaying breakwater for protection of the fishing boats entering and leaving the shore facilities.
Foundation: rock bottom, after underwater rock blasting/breaking preparation and dredging.
Exterior face protected with armor rock.

Length: 250 m
Height: +6.00 m datum
Concrete volume: 6430 m^3
Armor stone volume: 25 000 ton
Blasting and dredging: 5850 m^3

Resumo da Obra
Work Summary

Cliente	**Instituto Marítimo- Portuário**	*Client*
Projectista	**Instituto Marítimo- Portuário**	*Designer / Engineer*
Tipo de contrato	**Chave-na-Mão**	*Contract type*
	Turn-Key	
Data de construção	**Aug1999/Sep2000**	*Construction period*
Custo	**PTE 346.000.000**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
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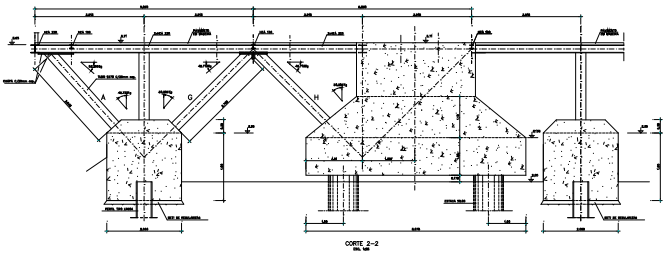
EXPO'98 - Dique de Fecho e Eclusa
EXPO'98 - Closure Dyke and Lock

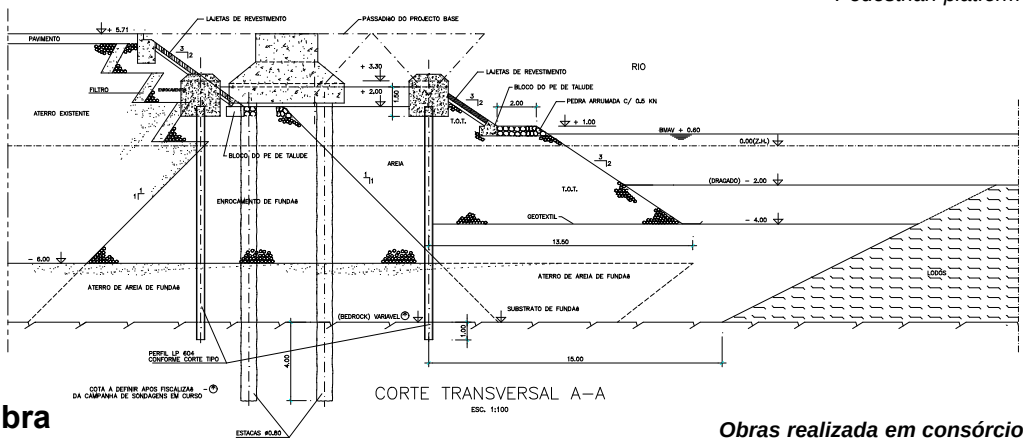
Ensecadeira da eclusa
Lock cofferdam

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 m^3 (including transport and discharge on the sea
- Enrocamento - 150 000 m^3



Plataforma pedonal
Pedestrian platform



Resumo da Obra
Work Summary

Obras realizada em consórcio
Joint-venture works

Cliente	**Parque EXPO, SA**	*Client*
Tipo de contrato	**Chave-na-Mão**	*Contract type*
	Turn-Key	
Data de construção	**1998**	*Construction period*
Custo	**PTE 3.200.000.000**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
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e-mail: seth@seth.pt
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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 varadoura e cais de apoio

Estacas cravadas: ∅ 508 mm, 22 unidades

Work description

Construction of a boats ramp and ancillary quay

Driven steel piles: ∅ 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	**Câmara Municipal de Tavira**	*Client*
Inspecção	**Câmara Municipal de Tavira**	*Inspection Agency*
Tipo de contrato	**Série de Preços** ***Unit Prices***	*Contract type*
Data de construção	**1999**	*Construction period*
Custo	**€ 361.000**	*Cost*

Avenida Tomás Ribeiro, 145
2790-467 QUEIJAS - Portugal
Tel: +(351) 219 43 14 79 / Fax: +(351) 219 43 15 18
e-mail: seth@seth.pt
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