

Project and Management Construction Supervision



coba
GROUP

ENGINEERING AND ENVIRONMENTAL CONSULTANTS

PRESENTATION

COBA is a multinational and multidisciplinary group of Engineering and Environmental Consultants, founded in 1962.

The Group provides engineering consultancy services ranging from basic and planning studies, technical, environmental and economic feasibility studies, design and construction design as well as project management and works supervision, to operation follow-up and behaviour monitoring.

The Group has offices/subsidiaries in three continents and experience in more than forty countries and encompasses several companies in accordance with functional specializations or geographical areas.

The competences acquired along the last six decades, together with the state-of-the-art employee expertise, the stability of its permanent staff and the comprehensive international experience allow to find out the best solutions for the full satisfaction of public and private Clients' needs and expectations.

During its existence, the Group has participated, together with public authorities or private developers, in the feasibility of multidimensional projects, some of them being structuring projects and with major impacts on the improvement of peoples' life conditions in the several countries where it worked.

At present, the group has a wide number of competences and technical areas that allow the composition of multidisciplinary teams who share knowledge and experiences in the execution of projects.

FIELDS OF ACTIVITY

HYDRAULIC UNDERTAKINGS

Concrete, Earth-fill and Rock-fill Dams | Weirs and Reservoirs | Water Conveyance Systems | Hydraulic Structures

POWER GENERATION AND TRANSMISSION

Hydroelectric Power Plants | Small Hydropower Plants | Power Plants Rehabilitation and Modernization | Substations | High Voltage Transmission Lines | Cooling Water Systems for Thermoelectric Plants

WATER SUPPLY AND WASTEWATER SYSTEMS

Catchment, Transport and Distribution of Potable Water | Water Treatment Plants | Drainage Systems | Wastewater Treatment Stations | Pumping Stations

AGRICULTURES AND RURAL DEVELOPMENT

Irrigation and Drainage Systems | Rural Roads | Production Systems Mapping and Basic Information

TRANSPORTATION INFRASTRUCTURES

Roads and highways | Railways | Passenger and Freight Railway Stations Metro and Light Rail | Airports | Bridges and other engineering structures

ENVIRONMENT

Environmental Impact Assessment | Environmental Management, Monitoring and Auditing | Pollution Control | Landscaping | Land Management | Recovery of Degraded Areas | Waste Landfills

GEOTECHNICAL STRUCTURES

Tunnels and Caverns | Slopes in Fill and Cut Section | Special Foundations Breakwaters | Embankment Works

MARITIME AND FLUVIAL WORKS

Wharfs | River Training | Quay Rehabilitation | Flood and Flow Control

MINING INDUSTRY

Environmental Studies | Design of Tailings Dams and Related Structures Safety Assessment of Tailings Dams | Design Review of Tailings Dam Closure Operations Maintenance and Monitoring Manual for Tailings Dams Risk Analysis | Mine Closure Plan | Training

BUILDINGS

Residential and Services Buildings | Industrial Buildings | Steel and Mixed Industrial Structures | Rehabilitation and Restoration of Ancient Buildings

CARTOGRAPHY AND CADASTRE

Geographic Information Systems (GIS) | Digital Cartography | Thematic Cartography | Thematic Cadastres | Land Acquisition

SAFETY CONTROL AND REHABILITATION

Expertise, Monitoring | Inspection and Reinforcement of Dams and Transportation Infrastructures | Works Instrumentation | Project Maintenance and Operation

PROJECT MANAGEMENT AND CONSTRUCTION SUPERVISION

Project Management | Cost Management | Site Supervision Quality Assurance/Quality Control

CAMBAMBE HYDROPOWER DEVELOPMENT 714 MW - Angola

CONSTRUCTION OF POWER PLANT II FOR POWER STRENGTHENING

Client/Owner: ENE – Empresa Nacional de Eletricidade

Design Review, Technical Assistance and Construction Supervision: 2011/2017

Project
Management

The Cambambe Hydropower Development is located in the Kwanza River, approximately 180 km southwest from the city of Luanda and about 15 km from the city of Dondo. It was initially designed and built for a phased construction.

Phase II of the project is currently ongoing and includes the construction of the Cambambe II Power Plant. The Phase II works are divided into two lots: civil construction works (power plant II) and electrical and mechanical equipment (supply and erection).

Power plant II is an underground plant with an installed capacity of 714 MW.

It includes the following main components:

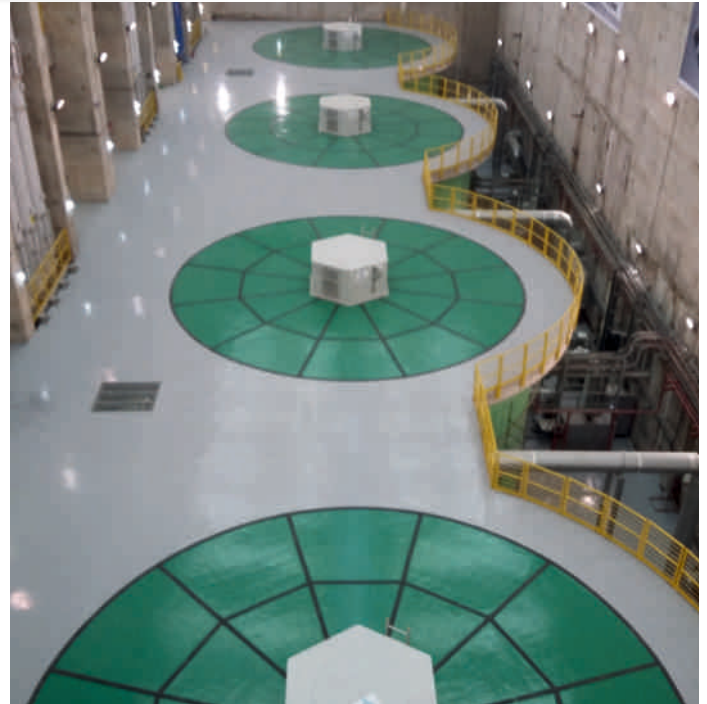
- a new water intake and water conveyance tunnel;
- a power plant, the respective units, transformers, substation and ancillary systems: access tunnel and control building;

A feeder canal and discharge tunnel located downstream.

Second hydro power plant (Cambambe II)

4 Francis units 714 MW

4 x 440 m long headrace tunnels (7,7 m Ø)



LAÚCA HYDROPOWER PROJECT 2 070 MW - Angola

Client/Owner: MINEA - Ministério da Energia e Águas / GAMEK - Gabinete de Aproveitamento do Médio Kwanza

Review of the Basic and Detailed Designs; Coordination and Supervision of the Construction Works: 2012/2023

Project
Management

The Laúca Hydropower Development (2 070MW) is located in the Kwanza River, about 47 km downstream from the Capanda Hydropower Undertaking, currently under operation, and principally envisages energy generation.

The undertaking is composed of a RCC dam, an underground water conveyance system (energy generation (2 004 MW), a toe-of-dam

water conveyance system (ecologic flow (65,5 MW)) and a main underground power plant.

- 6 Francis units 2 004 MW

- RCC Dam (132 m high, 1 075 m crest length)

- 6 x 1 900 m long headrace tunnels (9,0 x 12,0 m²)



CACULO CABAÇA HYDROPOWER DEVELOPMENT 2120 MW + 52 MW - Angola

Client/Owner: GAMEK - Gabinete de Aproveitamento do Médio Kwanza

Design and Tender Documents, including Technical Assistance to the Owner during

Evaluation of Bids for Construction of the Undertaking: 2013/2014

Owner's Engineer. Technical Assistance. Construction Design Review: 2017/Ongoing

Construction
Supervision

The undertaking is located in the Kwanza River and its envisaged capacity amounts to 2120 MW. It includes:

- RCC 100 m-high dam with a 550 m long crest. The spillway is designed for a flow of 10 000 m³/s.

- Temporary river bypass on the right bank, done through two tunnels with a diameter of 14,4 m and an average length of 360 m each.

Cavern power plant with water conveyance systems on the left abutment. The two tailrace tunnels, with an arch-rectangle section with a height/width of 16 m, end at about 5.2 km downstream from the surge chamber, which in turn is located downstream from the turbines, which produces a maximum gross head of 215 m, taking advantage of a natural slope close to 115 m. The plant shall be equipped with four Francis units with a rated capacity of 530 MW each (2120 MW). In order to use the ecological flow for energy generation, the construction of a second power plant with a capacity of 52 MW is envisaged.



SOUTHERN EXPANSION OF CERRO DE LOBO TAILINGS FACILITY - Portugal

Client/Owner: SOMINCOR, S.A. (Lundin Mining)

Final Design, Technical Assistance, Occupational Health and Safety Coordination,

Environmental Control, and Construction Supervision: 2021/Ongoing

Construction
Supervision

The Cerro do Lobo TSF Expansion Project includes the expansion of the existing 187.9 ha disposal area by a further 18.5 ha. There will be a levelling of the expansion area to shape the deposit area, obtaining clean excavation materials from earthworks for the construction of the dykes and for the topsoil, while gaining volume for the deposit and ensuring minimum tailings thicknesses required for the geochemical stability of the deposit.



SINES PORT EXPANSION PHASE 3 - Portugal

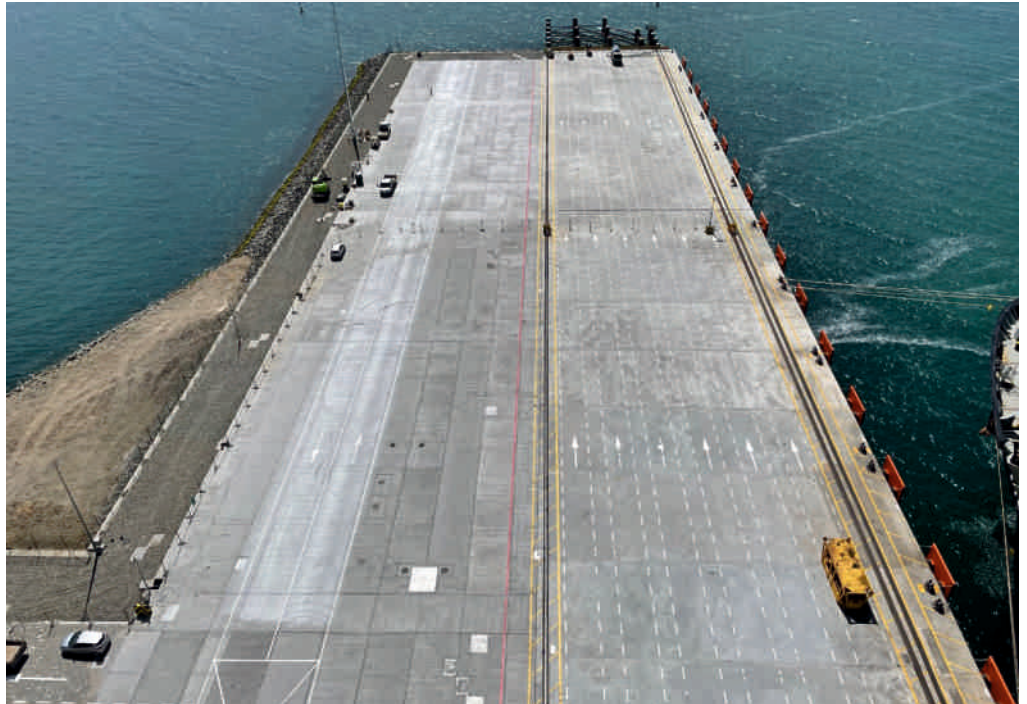
Client/Owner: PSA Sines – Terminais de Contentores, S. A.

Construction supervision: 2021/2022

Construction
Supervision

The works consisted of the Extension of the PSA Sines Wharf, with the following works:

- Construction of 204 m of wharf
- Execution of embankments and marginal retention of the backreach, in TOT with a slope of 3 (horizontal) by 2 (vertical), with two types of marginal protection; Execution of hydraulic infrastructures of the backreach
- Execution of electrical infrastructures of the backreach, with boxes and pipes for subsequent passage of cables, earthing network, lighting columns and foundations and Wi-Fi columns and foundations
- Paving of the backreach platform with gravel track, eRTG track and vehicle circulation track



REINFORCEMENT OF THE SEAWATER INTAKE OF PHASE I OF THE TURBOT FATTENING UNIT AT THE “MIRA” BEACH - Portugal

Client/Owner: ACUINOVA, S.A.

Construction Supervision and Safety Coordination on Site: 2017/2020

Construction
Supervision

Manufacture and placing of 24 ton concrete blankets over the submerged sea water catchment pipes.

- First phase in charge of Mota-Engil, with the execution of 80 concrete blankets. 47 concrete layers were laid between 7/10 and 2/11/2017 (significant wave height <1.5m, wind <18 knots, wave period <10s). Contract value: 510 283 euros.

- Second phase with the execution of 53 concrete slabs. 25 concrete slabs were laid by ETERMAR between 3 and 5/10/2018 (maximum wave height <1.25m). Contract value: 426 031 euros.
- Third phase with the placement of 30 concrete slabs by ETERMAR. Awaits start depending on sea conditions.



DOUBLING OF NATIONAL ROAD NR01 BETWEEN CHIFFA AND BERROUAGHIA, OVER A LENGTH OF 53 Km - Algeria

Client/Owner: Agence Nationale des Autoroutes (ANA)

Design Review, Project Management and Construction Supervision: 2013/2020

Construction
Supervision

Project involving a motorway length of approximately 53 km, between La Chiffa and Berrouaghia, on very difficult topographic conditions, divided into 3 lots:

Lot 1: Section between La Chiffa and El Hamdania, with 14,242 km, subdivided into 3 subsections.

Lot 2: Section between El Hamdania and Berrouaghia, with 38,138 km, subdivided into 7 subsections.

Lot 3: Current Engineering Structures, Bridges and Tunnels, as follows:

Current Engineering Structures and Bridges:

Current Engineering Structures: 41

Bridges: 35

Total extension: 16,359 km

Tunnels:

Tunnel T-6.3: Alger Direction: 946 m Boughzoul Direction: 962 m

Tunnel T-7.7: Alger Direction: 1795 m Boughzoul Direction: 1833 m

Tunnel T-10.0: Alger Direction: 180 m Boughzoul Direction: 215 m

Total Extension: 5,931 km

Seven interchanges and several relocations are included



REFORMULATION OF THE ROAD NETWORK WITHIN THE COMMERCIAL AREA OF ALFRAGIDE - Portugal

Client/Owner: IKEA – Móveis e Decoração, SA

Preliminary Study, Final Design, Project Management, Construction Supervision: 2003/2005

Construction
Supervision

The studies pertain to the Reformulation of the Road Network within the Alfragide Commercial Zone, comprising the new access roads and infrastructures associated to the establishment of the first IKEA Shopping in Portugal.

Interventions mainly comprise reformulation of the existing network with a total length of approximately 6.690 meters, contemplating the construction of two viaducts – the IKEA viaduct (which crosses NR 117 and is about 235 m long) and the DECATHLON viaduct (over an existing roundabout), and the widening and duplication of an underpass in relocation 2.

A new 4-lane connection road was also considered that contours the IKEA building from the North, linking a roundabout situated in the Zambujal road to one located close to NR 117 and to the viaduct.

Additionally, the project included an exit from NR 117 (Lisbon / Amadora direction) with connection to this roundabout, allowing incoming traffic from Belém, Algés, Restelo, etc., via NR 177, a direct access to IKEA premises (existing and future) without overburdening the local road network.



NORTHERN RAILWAY LINE SUBSECTION 3.3 - OVAR/GAIA - Portugal

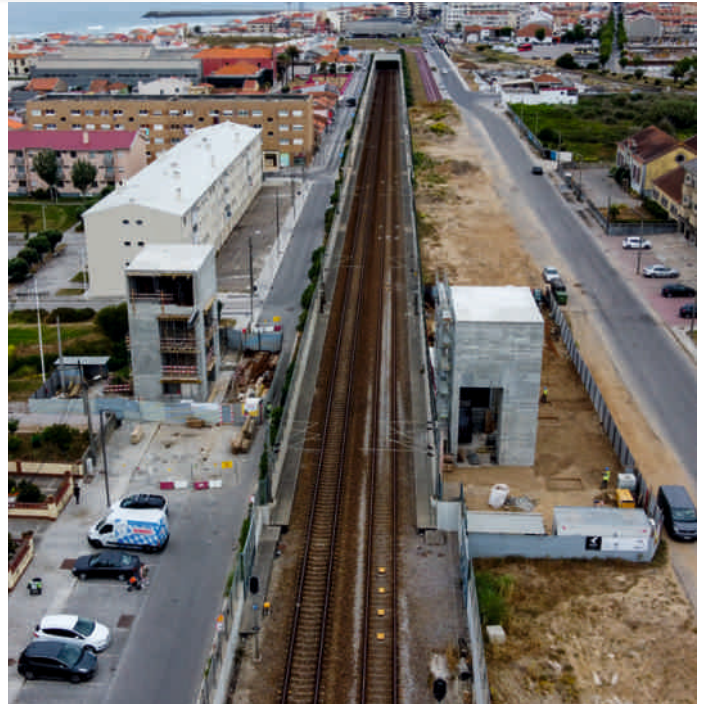
Client/Owner: Infraestruturas de Portugal, S.A.

Management, Supervision and Safety and Health on Site: 2020/Ongoing

Construction
Supervision

Consultancy Services for Management, Coordination, Works Supervision and On-site Safety Coordination of Full Track Upgrading Works and Levelling on the Reach between km 318.600 (Espinho) and 332.780 (Gaia), which, in general, include the following interventions:

- Full replacement of the track superstructure;
- Change in the layouts of Granja and Vila Nova de Gaia stations;
- Laying of holding yards for freight trains of 750 metres;
- Sanitation/treatment of the track substructure in point areas;
- Drainage infrastructures, works for changing the PH;
- Full replacement of the catenary system;
- Full upgrade of catenary points;
- Construction of road and pedestrian grade separations, including access by-passes, for the removal of level crossings;
- Construction of pedestrian grade separations to close level crossings, linking passenger quays;
- Construction of new passenger quays at stations and halts;
- Implementation of the traction current return and earthing protection system;
- Sealing of the railway track.



ALGARVE RAILWAY LINE ELECTRIFICATION - Portugal

Client/Owner: Infraestruturas de Portugal, S.A.

Management, Coordination, Supervision and Coordination of Safety at Work: 2021/Ongoing

Construction
Supervision

Algarve Railway Line Electrification. Tunes-Lagos and Faro-Vila Real de Santo António sections.

Construction of the Tunes and Olhão substation expansion and complementary works contracts for signalling and telecommunications.



SENA RAILWAY LINE IN BEIRA RAILWAY SYSTEM - Mozambique

REHABILITATION AND EXPANSION WORKS

Client/Owner: CFM - Portos e Caminhos de Ferro de Moçambique, E.P.

Final Design Review and Construction Supervision: 2014/2016

Construction
Supervision

The construction works of the Sena Line rehabilitation and expansion project aim to increase the transport capacity (20 Mt/year) of this Railway Line, located in the centre of Mozambique, with a total extension of about 547 km, connecting Dondo to Moatize.

The Sena Line Construction Works cover the interventions at the D. ANA BRIDGE, namely the substitution of the current track equipment, with reinforcement of the railway tie fixation to the walls.



REQUALIFICATION OF THE RAILWAY BRANCH OF THE SINES PORT - Portugal

Client/Owner: APS – Administração dos Portos de Sines e do Algarve, S.A.

Construction Supervision: 2019/2020

Construction
Supervision

This project allows to respond to possible future expansions associated with the increase in the volume of goods transport, allowing the operation of compositions with 750 m in length.



ALTO TÂMEGA HYDROPOWER PROJECT 1154 MW - Portugal

Client/Owner: IBERDROLA

Geological-Geotechnical Assistance for the Project's. Construction Supervision: 2016/Ongoing

Construction
Supervision

This hydropower complex involves the construction of three hydraulic undertakings. The hydraulic undertaking of **Gouvães** consists of a concrete gravity dam with a maximum height of 30 m and a powerplant with an installed capacity of **880 MW**.

The hydraulic undertaking of **Alto Tâmega** has a 107,5 m-high concrete arch dam and a powerplant with an installed capacity of **160 MW**.

The hydraulic undertaking of **Daivões** comprises a concrete arch dam with a maximum height of 76 m and a powerplant with an installed capacity of **114 MW**.



PARADELA DAM. CONSTRUCTION OF THE ADDITIONAL SPILLWAY - Portugal

Client/Owner: EDP – Gestão da Produção de Energia, S.A.

Construction Supervision: 2009/2011

Construction
Supervision

Paradela Dam. Construction of the Additional Spillway

- Construction of a new spillway in order to meet with the needs of the new design flood defined in the safety, structural and operational evaluation;
- Remedial action in the dam crest
- Remedial actions in the electrical equipments and buildings associated with the bottom outlet in order to be in conformity with Safety Regulations.
- Definitive deactivation of frontal spillway.



RIBEIRADIO - ERMIDA HYDROPOWER PROJECT 83 MW - Portugal

Client/Owner: GreenVouga (Owner: EDP - Gestão da Produção de Energia, SA)

Construction Supervision: 2010/2015

Construction
Supervision

2 DAMS - RIBEIRADIO AND ERMIDA

RIBEIRADIO

- Type: Concrete gravity dam
- Height: 83 m
- Crest length: 265 m
- Reservoir capacity: 136 million m³
- Concrete volume: 290 000 m³

ERMIDA

- Type: Concrete gravity dam
- Height: 35 m
- Crest length: 175 m
- Reservoir capacity: 4 million m³

HYDROPOWER PLANT

- Installed capacity: 74,5 MW / 8,0 MW

SUBSTATION

- Transformers: 86 MVA / 9 MVA
- 15/67 kV / 6/15 MVA



Ribeiradio dam

RNT (NATIONAL POWER GRID) INFRASTRUCTURES - Portugal

Client/Owner: REN – Rede Eléctrica Nacional, S.A.

Quality and Environmental Supervision & Safety Coordination: 2016/Ongoing

Construction
Supervision

Riba D'Ave Substation Works (SRA): 22.34 Works – HV/LV Equipment renewal, Phase 1, partial modification of the existing layout of the two circuits connecting the power transformers TR III and TR IV and the corresponding 60 kV panels, formed by 60 kV isolated cables. 22.34, 22.35, 22.36 Works – Overall remodeling of the Substation. - Ongoing

Construction works of the Riba D'ave – Recarei 1 line, 400 kV, OPGW cable installation. 2016

Canelas Substation works (SCN): 220/60kV (24.21;24.17;24.18 Works). Remodelling of Protection and Operation Systems. Ongoing

Feira Substation Works (SFRA) 400/60 kV - Shunt Reactance Installation (36.02 and 36.03 Works). 2017

Recarei Substation Works (SRR) – 3rd TRF 220/60kV 170MVA . 2017

Remodeling and upgrading of power transmission capacity of the Alto Rabagão - Frades Line (150kV).



LNG TERMINAL AT SINES - Portugal

Client/Owner: Transgás Atlântico

Design and Construction Supervision: 2000/2002

Construction
Supervision

Studies and supervision of the excavations and earthworks and upgrading of regional road VR 53.



SECONDARY EDUCATION SCHOOLS - Portugal MODERNIZATION PROGRAMME

Client/Owner: Parque Escolar, E.P.E.

Construction Management and Supervision and Coordination of Safety and Health on Site for Phase 2A: 2009/2011

Construction
Supervision

Lot 6: (Lote nr. 2AS2)

- Sá da Bandeira Secondary School, Santarém
- Ponte de Sôr Secondary School
- Salvaterra de Magos Secondary School

- Jacôme Ratton Secondary School, Tomar
- Dr. Solano de Abreu Secondary School, Abrantes
- Ourém Secondary School



Salvaterra de Magos Secondary School



 JULY | 2023



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