

References by activity

RAILWAYS



References by activity

RAILWAYS

Spain

- ▶ Córdoba-Málaga
- ▶ Madrid-Levante
- ▶ Madrid-Lleida
- ▶ Orense-Santiago
- ▶ MetroNorte SS

Algeria

- ▶ Ouargla tramline

Norway

- ▶ Follo Line tunnels



RAILWAYS

CÓRDOBA- MÁLAGA

LOCATION ▶ Córdoba and Málaga (Spain)

CUSTOMER ▶ ADIF

PROJECT SCOPE:

Project design, installation and maintenance by a consortium - overhead power line and ancillary systems on the Córdoba-Málaga high-speed rail network. The scope includes 155 km of the 25 kV overhead power line

AMOUNT ▶ EUR 107 million (ENO 28.5%)

START DATE ▶ december 2004

FINISH DATE ▶ october 2009

CHARACTERISTICS:

- ▶ 155 km double track
- ▶ 25 km tunnels
- ▶ Design speed: 350 km/h
- ▶ 1x25 and 2x25 kV AC 50 Hz electric traction line
- ▶ 1435 mm UIC gauge
- ▶ Lattice posts
- ▶ Aluminium tube cantilevers



SPAIN

Córdoba and Málaga (Spain)

RAILWAYS

CÓRDOBA- MÁLAGA





RAILWAYS

MADRID- LEVANTE

LOCATION ▶ Cuenca, Albacete and Valencia (Spain)

CUSTOMER ▶ ADIF

PROJECT SCOPE:

Construction design for electric traction substations, their autotransformer units and remote energy control system on the Levante high-speed rail network, sections Motilla del Palancar-Valencia, Motilla del Palancar-Albacete and Torrejón de Velasco-Motilla de Palancar

AMOUNT ▶ EUR 64 million

START DATE ▶ may 2008

FINISH DATE ▶ april 2011

CHARACTERISTICS:

- ▶ 8 traction substations, with the following 400 kV basic configuration:
2 x three-phase rotating cutouts with earthing blades. 4 voltage transformers. 4 protection and measurement current transformers. 2 two-phase switches. 4 protection and measurement current transformers. 4 automatic valves. 2 power transformers, 60 MVA, 400/2x27.5 kV.
- ▶ 10 final autotransformer units, with:
4 x 15 MVA power autotransformer units. 10 x 55 kV cells. 2 x 750/230 V auxiliary transformers
- ▶ 30 intermediate autotransformer units, with:
2 x 15 MVA power autotransformer units. 4 x 55 kV cells. 2 x 750/230 V auxiliary transformers



SPAIN

Cuenca, Albacete and Valencia
(Spain)

RAILWAYS

MADRID- LEVANTE





RAILWAYS

MADRID- LLEIDA

LOCATION ▶ Madrid, Guadalajara, Zaragoza, Lleida (Spain)

CUSTOMER ▶ ADIF

PROJECT SCOPE:

Project design, installation and maintenance - overhead power line and ancillary systems on the Madrid-Zaragoza-Barcelona-French border high-speed rail network, section Madrid-Lleida. The scope includes 917 km of the 25 kV overhead power line

AMOUNT ▶ EUR 90 million

START DATE ▶ april 2000

FINISH DATE ▶ april 2006

CHARACTERISTICS:

- ▶ Design speed: 350 km/h
- ▶ 1x25 y 2x25 kV AC, 50 Hz electric traction line
- ▶ 1435 mm UIC gauge
- ▶ Lattice posts
- ▶ Aluminium tube cantilevers
- ▶ Copper-magnesium contact wire: 150 mm²
- ▶ Nominal contact wire height: 5,300 mm



SPAIN



Madrid, Guadalajara, Zaragoza,
Lleida (Spain)

RAILWAYS

MADRID- LLEIDA





RAILWAYS

METRONORTE SS

LOCATION ▶ Madrid (Spain)

CUSTOMER ▶ Madrid Metro

PROJECT SCOPE:

1,500 Vdc electrical substations on Madrid's MetroNorte line

AMOUNT ▶ EUR 17 million

START DATE ▶ september 2006

FINISH DATE ▶ may 2007

CHARACTERISTICS:

- ▶ Outfitting of substations
 - ✓ Station 1 (Tres Olivos)
Installed capacity: 9,000 kW
3 x 3,000 kW transformer/rectifier units
3 feeder cells
1 by-pass cell
 - ✓ Stations 6 (La Moraleja) and 9 (Bautana)
Installed capacity: 6,000 kW
2 x 3,000 kW transformer/rectifier units
2 feeder cells
1 by-pass cell
- ▶ Interconnections
 - ✓ Fuencarral substation and Station 1 substation
– one 5 kV cable
 - ✓ Station 1 substation and Station 3 substation
– two 15 kV cables
 - ✓ Station 3 substation and Station 6 substation
– two 15 kV cables
 - ✓ Station 6 substation and Station 9 substation
– two 15 kV cables
 - ✓ Station 9 substation and Station 11 substation (Hospital del Norte) – two 15 kV cables
- ▶ Work on Alto Arenal control centre and Puerta del Sur replication post (for control of substations)



SPAIN

Madrid (Spain)

RAILWAYS

METRONORTE SS





elecnor

RAILWAYS

ORENSE-SANTIAGO

LOCATION ▶ Orense and A Coruña (Spain)

CUSTOMER ▶ ADIF

PROJECT SCOPE:

Project design, installation and maintenance - overhead power line and ancillary systems on the Orense-Santiago high-speed rail network. The scope includes 85 km of the 25 kV overhead power line

AMOUNT ▶ EUR 29 million

START DATE ▶ april 2010

FINISH DATE ▶ december 2011

CHARACTERISTICS:

- ▶ 85 km double track
- ▶ 28 km tunnels
- ▶ 19 km viaducts
- ▶ Design speed: 350 km/h
- ▶ 1x25 y 2x25 kV AC, 50 Hz electric traction line
- ▶ 1435 mm UIC gauge
- ▶ Lattice posts
- ▶ Aluminium tube cantilevers



SPAIN

Orense and A Coruña (Spain)

RAILWAYS

ORENSE-SANTIAGO





RAILWAYS

OUARGLA TRAMLINE

LOCATION ▶ Ouargla (Algeria)

CUSTOMER ▶ Entreprise Métro d'Alger

PROJECT SCOPE:

Infrastructure contract to build the city of Ouargla's first tramline, from Hai Nasr to the old town centre, known as the Ksar Loop, in two sections, 8.1 km and 4.5 km

AMOUNT SECTION 1 ▶ EUR 230 million
(ENO 60 M)

START DATE ▶ november 2013

FINISH DATE ▶ october 2016

CHARACTERISTICS:

- ▶ Total length of 12.6 km, 2.4 km of which are single-track, on the Ksar Loop
- ▶ 6 HA living quarters for 300 people
- ▶ Structure in the Hai Nasr area over the RN49 highway: metal bow-string bridge
- ▶ Hydraulic construction in the Hai Nasr area
- ▶ Two metal pedestrian walkways: Multimodal station and "Université 1" station
- ▶ Rerouting of water, lighting, electricity services etc.
- ▶ Construction of rail platform and track work
- ▶ Work on road systems in public areas
- ▶ Supply and assembly of the overhead tram power line
- ▶ Work on public lighting system
- ▶ Work on illuminated traffic signs
- ▶ Construction of buildings for workshops and depots
- ▶ Construction of control buildings and command centre
- ▶ Construction of high-voltage unit
- ▶ Construction of 25 operating units along the tramline

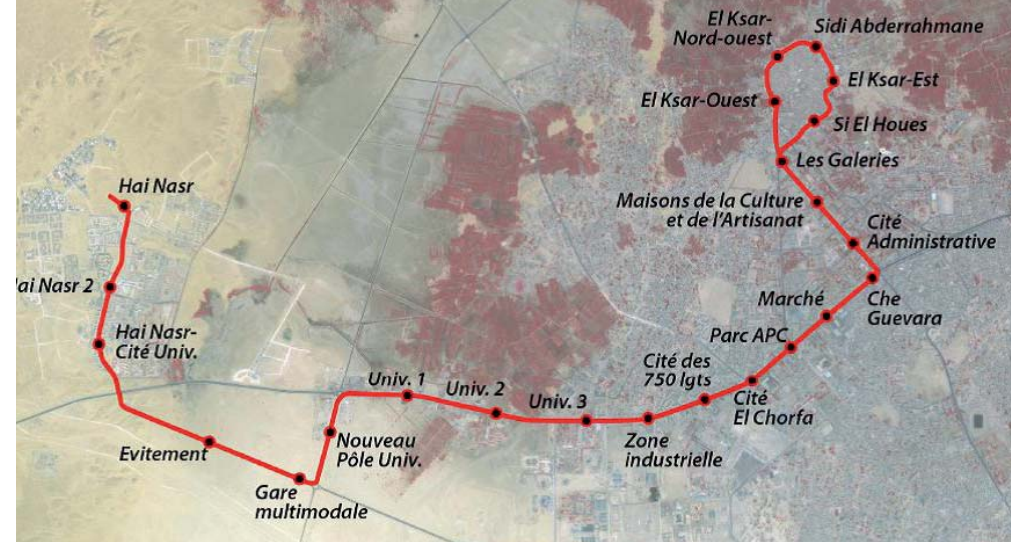


AFRICA

Ouargla (Algeria)

RAILWAYS

OUARGLA TRAMLINE





RAILWAYS

FOLLO LINE TUNNELS

LOCATION ▶ Oslo (Norway)

CUSTOMER ▶ Norwegian Rail Administration
(through the Acciona-Ghella consortium)

PROJECT SCOPE:

Rail infrastructure for the high-speed (200 km/h) twin railway tunnels to link up Oslo with the city of Ski. The tunnels will span 20 kilometres, making them the longest to be found in Scandinavia

AMOUNT ▶ EUR 80 million

START DATE ▶ July 2015 (design)

FINISH DATE ▶ December 2020 (15 month of construction, testing and start-up)

CHARACTERISTICS:

- ▶ 2 single-tube tunnels measuring 20 km plus a section of approximately 80 m²
- ▶ Interconnections link up the two tunnels every 450 m along their route, along with rescue areas and evacuation zones
- ▶ Rail systems needed to ensure the proper functioning of the electromechanical installations and systems (ventilation, fire protection and control and firewalls)



EUROPE

Oslo (Norway)

RAILWAYS

FOLLO LINE TUNNELS



Sketch: The rig area at Åsland between Oslo and Ski



Main tunnel with tunnel boring machines (TBM)

