## Picture of the month

*Retaining wall for the Museum of Royal Collections. Plaza de la Armería. Madrid.*

## Current events

- Work starts on the Baztan-Bidasoa gas pipeline
- Work starts on the underwater gas pipeline to the Balearic Islands
- Madrid 2016 at www.fccco.es
- TBM sets record on metro line L9 to Barcelona airport

## ALPINE

- Rehabilitation of a motorway in Austria
- Tuttendorfer Breite decontamination project
- Award given in Bulgaria
- Wörthersee Stadium wins award
- Construction finished on underground car park in Linz

## Subsidiaries

- ESPELSA displays its MPDS, TOPFAS and EUMP systems at different South-American defence ministries.

## Contract awards

- Phase II of the Museum of Royal Collections
- The Autovía de los Túneles dual carriageway between San Miguel de la Barreda and Riaño
- New technology expression and innovation centre, Madrid
- Alterations and enlargement of premises at Barcelona's bulk admission and package-sorting centre and post office
- Section of the Timisoara/Arad Motorway in Rumania

## Other contract awards

- New dry dock. Barbate harbour, Barbate, Cádiz, for 5.2 million euro, for APPA, the public agency in charge of Andalusian harbours.
- Improvement of layout and intersections on Avenida de Israel, Panama, by M&S for 10 million euro.
- RORO naval infrastructure at Raos dock 8, Santander harbour, for 9.1 million euro, for the Santander Port Authority.
- Development of Polygon A, Badalona Harbour Sector 2, Barcelona, for 11.7 million euro, for Empresa Municipal Marina de Badalona.
- "Eje APA" gas pipeline, Navarra. APL, for Gas Natural.
- Alterations to the east wing of Hospital Santa María in Lérida for GISA, for 7.2 million euro.
- Sewer system and purification plant on the Esqueiro River, Cudillero, Asturias, for the Principality of Asturias Department of the Environment and Rural Development, for 3.6 million euro.

## Finished projects

- Serrería Bridge, Valencia.
- Muros Business Park development, La Coruña.
- Road access to Ferrol's enlarged outer harbour.
- 132 homes in Sabadell, Barcelona.
- Mossos d'Esquadra Station in Salou

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## CSR

- Water Is Not Alone. Dynamic hall at CONAMA 9
- CSR in introductory training
- Madrid Civil Engineers give awards
- 2007 Progress Report filed, acknowledged by United Nations

## Events

- Inauguration of Arqua, the Underwater Archaeology Museum in Cartagena
- The Minister of Development visits the SE-40
- New AVE section opened: Puerto de Santa María/Las Aletas
- Opening of the Fundación Barredo's bioclimatic building
- Opening of I-95 Express Lanes in Miami

## Contributions

- At the Fourth ACHE Conference

# FCC wins contract for phase two of the construction of the Museum of Royal Collections

The Spanish National Heritage has awarded FCC Construcción the contract to build phase two of the Museum of Royal Collections for 25.5 million euro.

FCC Construcción has handled the first phase of the job, which will be completed this month and consists in building the retaining walls and preparing the site. The second phase of work includes putting up the structure, which will be built of white concrete, with marble aggregate and cement of the same colour. The completion period will run to 14 months.

The new museum, designed by architects Emilio Tuñón and Luis Moreno Mansilla, will stand in the centre of Madrid, just southwest of the Royal Palace, between the Plaza de la Armería and Almudena Cathedral. It will have a floor area of 46,000 square metres, which will house a set of works of art, household goods, weapons, tapestries and other items that constitutes the world's leading royal collection.

The new museum will become a worldwide standard-setter for display spaces built in the twenty-first century, and it will be a key part of the peerless array of museums on offer in Spain's capital.

Construction of phase one, Museum of Royal Collections

# FCC Construcción wins the Autovía de los Túneles dual carriageway between San Miguel de la Barreda and Riaño.

Autovía de los Túneles dual carriageway, section between Riaño and Sama

The Principality of Asturias Department of the Environment, Land Planning and Infrastructure has chosen FCC Construcción, in a joint venture, to execute the first phase of work to twin the AS-17, also known as the Riaño Tunnel road. This project falls under the new 2006-2012 Mining Plan.

The job is to build the section between San Miguel de la Barreda and the northern mouth of the Riaño Tunnels, a 4,740-metre-long section of road, and it is worth over 34 million euro.

The twinned road between San Miguel de la Barreda and Riaño will eventually form part of the layout of the future AS-III regional dual carriageway connecting Avilés and Sama. FCC Construcción also participated in the work on the section of dual carriageway that has already been built between Riaño and Sama.

A good portion of the future dual carriageway between San Miguel de la Barreda and Riaño will run over viaducts or underground.

## New technology expression and innovation centre, Madrid

The City of Madrid Economy and Employment Department has chosen FCC, in a joint venture with another company, to build its new technology expression and innovation centre at the industrial premises formerly occupied by Boetticher, in Villaverde, Madrid.

The plan is to convert an old building, a prime example of 50's industrial architecture in reinforced concrete designed by the illustrious civil engineer Eduardo Torroja, into a new technology expression centre having a floor area of some 18,000 square metres.

The design includes an auditorium, classrooms, a coffee shop and a car park, plus wiring, AC/heating, plumbing, a public address system, CC-TV, a security system and photovoltaic solar and thermal power units.

## FCC wins the contract for alterations and enlargement of premises at Barcelona's bulk admission and package-sorting centre and post

Sociedad Estatal de Correos y Telégrafos has chosen FCC to perform alterations and enlarge its bulk admission and package-sorting centre and post office at Barcelona harbour.

The idea is to refurbish the existing industrial buildings, enlarge basements and unloading docks, remodel various areas and renovate the facilities. The area at issue measures 18,000 square metres, and all the while the facilities must continue to provide the service they are currently responsible for.

## The Rumanian government picks FCC for a section of the Timisoara/ Arad Motorway

The Central Roads Administration of Rumania has given the contract for a 32-kilometre-long section of what goes by the name of "the European Corridor", between the cities of Timisoara and Arad in western Rumania, to a joint venture featuring FCC Construcción for 161.2 million euro. The completion period is 24 months.

The motorway has two 3.75-metre-wide lanes of traffic in each direction, three-metre-wide verges and a four-metre median. The job includes the construction of 31 bridges and 13 crosswise drainage structures, plus a service area that will house operations, maintenance and police buildings. Some 440,000 tonnes of asphaltic agglomerate will be used in paving.

This project is subsidised by European development funds.

# Serrería Bridge opened

## The longest bridge in Spain and the tallest bridge in Valencia

Serrería Bridge

On 11 December the ribbon was cut on Serrería Bridge, also known as Azud del Oro Bridge, in the City of Arts and Sciences of Valencia.

Designed by Santiago Calatrava and built by FCC Construcción for CACSA (Ciudad de las Artes y de las Ciencias, S.A.), this major piece of infrastructure has a span of 155 metres, is 180 metres long and stands 123 metres tall, making it the longest bridge in Spain and the tallest point in Valencia.

It is a cable-stayed bridge built out of steel and white concrete. It has got 29 parallel rear cables stretched like the strings of a harp and four retaining cables holding up the bridge's entire weight, anchored to the curved central mast, which is tilted at a 40º angle.

The deck has got a six-metre-wide central spine from whose sides there spring 72 ribs, on which the concrete and asphalt are laid.

The final width comes to 39 metres, and it weighs 5,500 tonnes.

The lighting is designed to focus on the deck and the pylon.

The construction of this infrastructure opens up one of the most important thoroughfares of the city of Valencia, Bulevar Sur, and breaks through the horizontal flow of the City of Arts and Sciences, connecting the Oceanográfico, the Agora, the Umbracle, the Science Museum, the Hemisfèric and the Reina Sofía Hall of Arts.

Motorists can now drive right around the city thanks to Serrería Bridge, as it connects the Ronda Norte and the Bulevar Sur. With three lanes in each direction, the bridge will see an average traffic volume of 70,000 vehicles a day. In addition, it has already been fitted with a specific 3.5-metre-lane to accommodate tram line L2 in future. A pedestrian platform and a bike lane run right down the centre of the bridge.

# Development of Muros Business Park

The project to develop Muros Business Park in La Coruña, run by INFOINVEST, has been completed after nine months' work.

FCC Construcción has received 4.59 million euro for developing the area for construction. The park's 181,433 square metres have been divided up into 80,470 square metres for industrial use, 11,655 square metres for tertiary use and the rest for parking and services. There is a total of 92 lots in all, ranging in size between 600 and 3,000 square metres apiece.

The park has been equipped with a water supply, irrigation facilities, a fire-fighting system, a sewer and rainwater collection system, lighting, medium-voltage power and telecommunications.

One interesting feature of the park is its ecological wall, which reaches a height of 13 metres at its tallest and covers a total of 29,000 square metres.

The rest of the area will be outfitted as public facilities, services, streets and areas for parking and amusement facilities.

Running across the park are two lengthwise corridors and two transverse corridors measuring 23 metres across. This is space enough for two 3.5-metre-wide lanes, five metres of nose-to-kerb parking and two three-metre-wide sidewalks.

An 800-metre-long, 11-metre-wide access road has been laid from a roundabout on road AC-400, with an average heavy vehicle intensity of 992 vehicles.

This project is part of the Autonomous Community of Galicia's Sector Plan for Business Area Planning, whose object is to set the general conditions for the future introduction of business land.

### Basic Information

**Client:** Suelo Empresarial del Atlántico

**Builder:** FCC Construcción

**Budget:** 4.59 million euro

**Architectural supervisors:** Pablo Martínez Gallegos and Vicente Camaño Martínez

**Technical manager:** Óscar Seoane Ruiz (ICEACSA)

### Site Team

**Department head:** José Abarquero García

**Construction manager:** Javier Serrano Lafuente

**Production chief:** Daniel Álvarez Ramos

**Head surveyor:** Antonio Guerrero Moreno

**Foreman:** Alfredo Alonso González

Aerial view

# Road access to Ferrol's enlarged outer harbour

The Ministry of Development awarded FCC Construcción the contract to build the road access to Ferrol's outer harbour. The job is split into two tendering phases, Section I and Section II. The budget for Section I was 24,055,372 euro, and the budget for Section II, 44,930,952 euro.

The job consists in building a fast-lane road between Ferrol's new outer harbour, which perches on Cape Prioriño, and the district's main roadways, the AG 64 dual carriageway between Ferrol and Villalba and the AP9, in addition to more-local thoroughfares.

The new road is a total of 14.9 kilometres long (Section I is 4.9 kilometres long, and Section II, 10 kilometres long). There are two 3.5-metre-wide lanes, with an additional 3.5-metre-wide lane for slow-moving vehicles in some sections, and an outer verge 2.5 metres wide. It has got three junctions (Fontemaior, Marmacón and Catabois).

Four viaducts have been built. They were all made of precast girders except the Doñinos Viaduct, which used movable formwork. There are also seven overpasses, 20 underpasses and one 90-metre-long cut-and-cover tunnel.

# 132 homes in Sabadell

Located on Calle Brasil in Sabadell, Barcelona, this group of six buildings is grouped into three blocks, each of which contains 22 housing units (two of which, on the ground floor, are designed for the disabled) and one commercial unit. Each block has an entire floor of parking with room for 46 automobiles, to be shared by the two buildings.

The foundations were made of a pile wall and walls with formwork on one or both sides, solid slabs and single footings. The structure was made of concrete, with reticular reinforcements and prestressed floor plates with a compression layer. There are also metal pillars, albeit only on the top floor. The outer walls are facing brick, and there is a tiled hip roof.

The door and window frames are painted aluminium, and the indoor woodwork is sapele. The flooring is terrazzo. The kitchens come equipped with wall and floor cupboards, oven, granite countertop, gas cooker and smoke extractor. Equipped with gas lines, water lines, power lines, telephone lines, intercom and preparations for communications by cable.

The project includes the subsequent development of the lot.

**Site Team**

**Department head:** Carlos Gómez Salegui

**Construction manager, phase 1:** Jaume Boltà Fisa

**Construction manager, phase 2:** Salvador Miret Carceller

**Site technician:** David Marcos Valdeolmillos

**Foremen:** Manuel González Gómez-Valades y Juan Guirao Casanova.

**Office staff:** Carles Sáez Adrián

# Mossos d'Esquadra Station in Salou

FCC has built a new station in Salou for the Mossos d'Esquadra, Catalonia's regional police force. The job was assigned by GISA for the Catalonian regional government, the Generalitat.

The inauguration ceremony was attended by Generalitat President José Montilla, the Vice-president of the Generalitat, Josep Lluis Carod Rovira, and the head of the Regional Department of the Interior, Joan Saura, in addition to other personalities.

The building has got a total floor area of 2,719.40 square metres. It stands on an 8,300-square-metre triangular lot next to Universal Studios' Port Aventura theme park, and it was designed by Camilo Galletti.

The station has got three floors. The basement is for the shooting gallery, parking, storage and holding cells. The ground floor contains the public service areas and police premises, and the first floor holds the offices and conference rooms.

**Team**

| |
|---|
| **Department head:** Bernabé Sanz |
| **Construction manager:** Àlex Torrens |
| **Site technician:** Miguel Antón |
| **Quality technician:** Pau Rodriguez |
| **Installation technician:** Marti Vall |
| **Foreman:** José Manuel Montes |
| **Office staff:** Ofelia Seres |


Front of the station

# ALPINE to rehabilitate a motorway in Austria for 35 million euro

## A8 Innkreis between Pichl and Meggenhofen

FCC Construcción's Austrian construction subsidiary ALPINE has won the tender to rehabilitate the surface of motorway A8 Innkreis, between Pichl and Meggenhofen. The project comes to a total of some 35 million euro.

The contract covers the rehabilitation of 11.5 kilometres of roadway between kilometre points 19.458 and 31.033. A six-centimetre-thick layer of the surface will be stripped off, and a fresh layer of asphalt will be applied. In addition, the roadway will be widened by an extra three metres on each side, replacing the drainage ditches. The lateral beams will be replaced in several of the existing bridges, and 13,600 metres of sound barriers will be installed.

Starting in March 2009, traffic will run in two directions.

During the preliminary work, detours will be set up for some sections of the motorway, and two lanes of traffic will be

kept open at all times. Work requiring traffic to be reduced to a single lane will be done at night.

The motorway, which will be completely finished in December 2010, will be opened to traffic in two phases: the Passau-bound lanes will be opened in November 2009, and the Wels-bound lanes, in September 2010.

# ALPINE will do the 21-million-euro Tuttendorfer Breite decontamination project.

The National Decontamination Agency has engaged Tuttendorfer Breite, a joint venture partnering ALPINE Bau GmbH and Bilfinger Berger Bau GmbH, for the recovery of Tuttendorfer Breite, near Korneuburg, on a 21-million-euro budget. The recovery plan focuses on forestalling the spreading of pollutants and avoiding the pollution of groundwater by crude oil. Also included is ten years' control of the recovery plan. The construction work is already under way, and it is estimated to be finished in mid-2009.

The polluted Tuttendorfer Breite area is the site of an old oil refinery built in 1927 and run by a number of companies until it was closed in 1961. A great deal of oil and petroleum products have soaked into the ground there. A funnel-and-filter system will be used for the site's recovery. The first step will be to cover the polluted area with 1,200 metres of impermeable walls, so as to prevent the release of environmentally hazardous emissions. A built-in active charcoal filter or "gate" will strain the hazardous substances out of the groundwater that seeps through the polluted zone. Wells will also be dug to extract oil and eliminate the crude oil film lying on the water.

# ALPINE receives infrastructure construction award in Bulgaria

Bulgarian newspaper "Pari" has announced the winners of several awards for the construction sector.

ALPINE Bau GmbH has been given an award for its activities in the construction area in Bulgaria. The Bulgarian delegation of ALPINE received an award in the category of "Infrastructure Construction" in the "2007 Construction Company of the Year" competition sponsored by the "Pari" newspaper.

ALPINE was also the only non-Bulgarian construction firm to be chosen in this prestigious competition.

"Pari" gave prizes to a total of five construction firms for their output in 2007.

The Bulgarian market research organisation CBN set the award criteria. Construction volume was the main criterion, and companies were ranked accordingly. With this event "Pari" means to demonstrate that the construction sector in Bulgaria is one of the liveliest sectors.

**ALPINE in Bulgaria**

ALPINE Bau GmbH has had an office in Bulgaria since 2007. ALPINE is building the Tsankov Kamak hydraulic power plant in the south, with a cost of approximately 300 million euro. The Salzburg-based group is also involved in projects in the environmental engineering field, and it is building three end-to-end wastewater treatment plants in the cities of Sevlievo, Popovo and Burgas Meden Rudnik.


Peter Gfrerer, ALPINE's manager in Bulgaria.

# ALPINE finishes the Promenade underground car park in Linz

Underground car park on the Promenade in Linz

ALPINE Bau GmbH has finished construction on the underground car park on the Promenade, in the centre of Linz, which was opened on 4 December last. The job, which was for BIP Garagengesellschaft, came to 10.3 million euro, and it was completed in 18 months.

The car park was built using the lid construction method and stretches a total of 400 metres long, making it the lengthiest underground garage in Linz.

The Promenade car park has got a total of 488 parking spaces. Each of its three floors is painted a different colour. Two-thirds of the parking spaces are reserved for authorised vehicles.

**Archaeological remains**

The excavation work uncovered a 300-year-old stone bridge that was once used to reach the Landhous building. This valuable archaeological finding is being restored, and in future visitors to the building will be able enjoy it.

# Alpine-built Klagenfurt Stadium Wins Award

Wörthersee Stadium

Wörthersee Stadium, located in the Austrian city of Klagenfurt, built by ALPINE and designed by architect Albert Wimmer, has won the construction award given by the state of Carinthia in southern Austria, in recognition of the implementation of the architectural design.

The jury felt that the stadium blends well into the surrounding countryside. During the 2008 Euro Cup, Klagenfurt was referred to as "the most beautiful stadium in Austria". It is now looked upon as the city's new symbol.

Klagenfurt's Wörthersee Stadium is the most modern stadium in Austria. The building's attractive architectural features blend seamlessly into the idyllic surrounding landscape. The roof is a sickle-shaped steel lattice with a load-bearing superstructure built on the basis of pony girders.
The western side dips low to provide a better view of the Karavanken Mountains. Another innovation is the construction of a see-through VIP zone on the lower west side. The elevation of the east-side grandstands lends the elegant shell shape movement and underlines the outer elegance of the building as a whole.

Spectator movement was borne especially in mind when building the stadium. The throughway zone running all along the stadium's rim forms the architectural intersection between the upper and lower portions of the building.

**Job cost:** 65.2 million euro
**Developer:** Klagenfurt municipal government
**Architects:** Albert Wimmer ZT GmbH
**Construction period:** January 2006-August 2007
**Useful area:** 20,522 m2
**Net seating capacity:** 32,000 spectators
**Subsequent seating:** 12,500 spectators

# ESPELSA displays its MPDS, TOPFAS and EUMP systems at different South-American defence ministries

ESPELSA recently presented its MPDS command and control software system, its TOPFAS planning-support software system and its EUMP training and simulation software system for portable missile trainers at different top offices at the ministries of defence of Peru, Ecuador and Colombia.

During the American tour, ESPELSA's presentation of its MPDS system to operational pilots at Río Negro Air Force Base in Medellín, Colombia, was extremely successful. Base officers there have ordered a report on the system, so they can evaluate how well the system would work within their context.

The MPDS system was also presented at Las Palmas Air Force Base in Sucre, Peru, to personnel from the transport and combat units, and again in Ecuador at Simón Bolívar Air Force Base, located in Guayaquil.

The main common denominator throughout this round of presentations was the positive impact of the system's demonstrations. The system is currently installed and operational in all Spanish Air Force bases. It can plan, load data, analyse and administrate all the information on the different air missions performed by McDonnell-Douglas F-18's, Northrop F-5's, Mirage F-1's and CASA C-101's, and it also provides simple management of all aeronautical, tactical and intelligence information.

ESPELSA also received an especially warm welcome to its demonstration of how its EUMP simulator operates at Lima Infantry Academy, on a courtesy visit made in response to the invitation of members of the Peruvian Embassy in Spain, who evinced great interest in having this software system presented in their country after attending a show ESPELSA gave for the Spanish Infantry Academy in Toledo.

ESPELSA's initiative toward internationalisation is opening up outlooks for expansion into new specialised markets in America.



# Minister of Development visits sites on dual carriageway SE-40

Minister of Development Magdalena Álvarez and the head of the Andalusia Council Department of Public Works and Transport, Luis García Garrido, visited the construction sites in Seville where what is termed the "southeast arc" of dual carriageway SE-40 is being built.

This is a 24.3-kilometre-long section that connects the Madrid-bound A-4 with the Cádiz-bound A-4, and the national government is investing over 207 million euro in the project.

The minister saw that progress is being made at a good pace at the sites she visited: the section from La Rinconada to Alcalá de Guadaira, which was the first section awarded for construction; the section from Alcalá de Guadaira to Dos Hermanas; and the section from Alcalá de Guadaira (junction with the A-49) to Alcalá de Guadaira (junction with the A-92).

FCC Construcción is handling the section of the East SE-40 between Alcalá de Guadaira (A-92) and Alcalá de Guadaira (A-376), which will connect the A-376 with dual carriageway A-92. The job (5.96 kilometres) begins at kilometre point 0+125 on the A-92 and ends on the A-376 (the Utrera road) at kilometre point 6+0.81. At this point there is a new junction, and the old junction providing access to Montequinto is to be remodelled. It is estimated that the work will take 30 months, and the budget is 58.5 million euro.

The SE-40 dual carriageway will make it possible to align and better the flow of the traffic from the different Andalusian dual carriageways that run through the metropolitan Seville area, which currently rely on the SE-30 to get through the city.

# Inauguration of the Underwater Archaeology Museum in Cartagena, Murcia

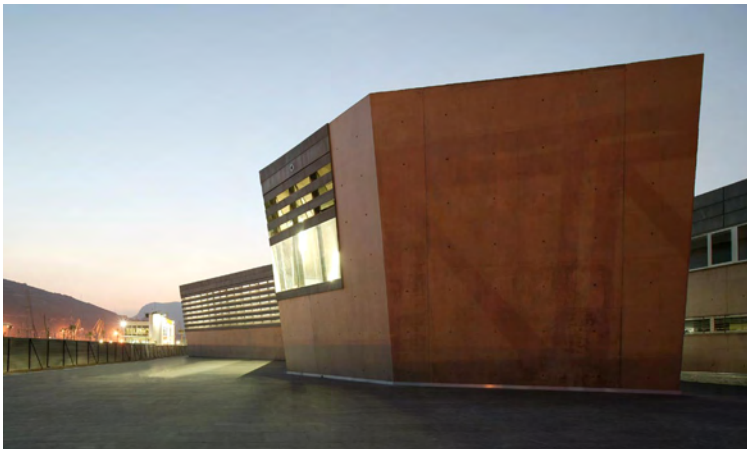

HRH Infanta Cristina inaugurating ARQUA

The Ministry of Culture has inaugurated ARQUA, the National Underwater Archaeology Museum, in Cartagena, Murcia. The museum was built and designed by architect Guillermo Vázquez Consuegra. The opening event was presided over by Her Royal Highness Infanta Cristina, who was accompanied by Minister of Culture César Antonio Molina and numerous personalities from political and cultural circles in the Region of Murcia.

The job had a budget of 20.84 million euro, covering construction of the building and the museum project now in progress.

The new museum, which has a total floor area of 6,000 square metres, will house over 1,000 submerged pieces from Spain's cultural heritage. In addition, it has been equipped with the latest technology in interactive videos and displays to help visitors gain a better understanding of the country's underwater cultural heritage. There are also classrooms and research rooms.

This is the first museum in Europe to be dedicated entirely to underwater archaeology, and it is estimated to receive around 80,000 visitors a year.



Outside view

# Opening of the Puerto de Santa María/Las Aletas section of the AVE high-speed railway

On 26 November Minister of Development Magdalena Álvarez opened a fresh section of the high-speed railway line between Cádiz and Madrid, the stretch between El Puerto de Santa María Station and Las Aletas. The new section is 6.2 kilometres long and was built by FCC Construcción.

Valdelagrana Station and El Puerto de Santa María Station are now open to trains, as are an additional 6.2 kilometres of this section. This completes the twin track for the entire distance between Jerez and the point where the line runs underground at Puerto Real (27.3 kilometres).

One of the more important jobs involved was the construction of two new viaducts, one over the Guadalete River (156 metres long) and one over the San Pedro River (112 metres long), and the remodelling of the old San Pedro Bridge.

With this job done, the three level crossings formerly intersecting with the line have also been eliminated.

The project was completed with the assembly of the new track and the total renovation of the existing track on multi-purpose sleepers to enable adaptation to international track width in future.

The old station at El Puerto de Santa María has been fully remodelled, and new facilities and a new building have been built.

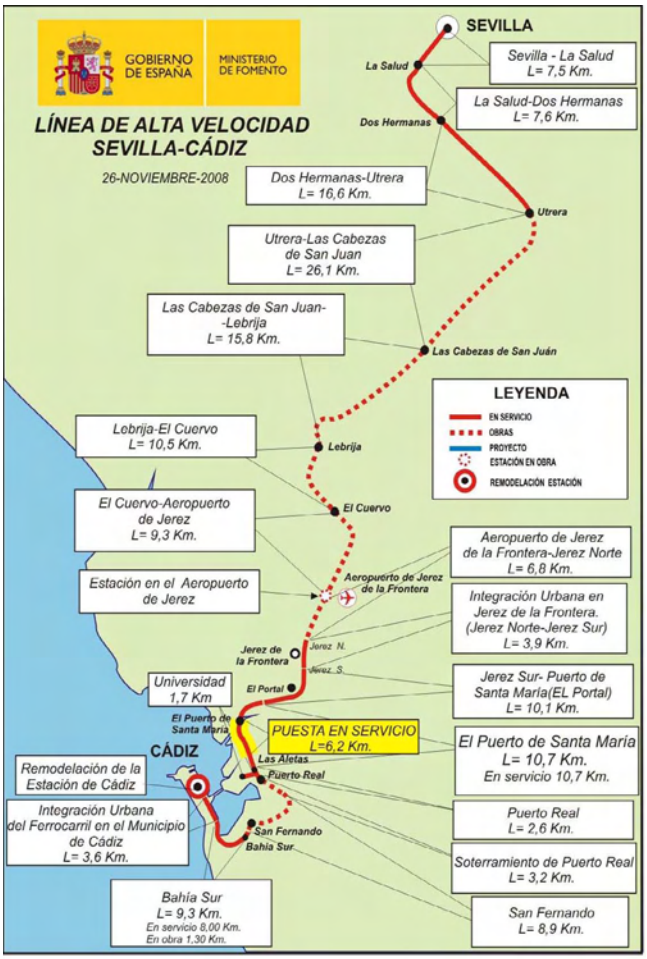
Car parks have been built on both sides of the tracks. They hold 350 cars.

Railway service has been maintained at all times during work.

Valdelagrana Station is a new commuter station situated next to the beach and the avenue of the same name, and it will provide access to the nearby Guadalete shopping area and Valdelagrana beach.

The building, designed with an emphasis on straight lines, is clad with ostionera stone, a brown, porous stone typical of the region. It contains a hall with ticket offices, a coffee shop and restrooms, and it is equipped with lifts for persons of reduced mobility.

The station has got two tracks and 160-metre-long platforms. The platforms are connected by a corridor that passes underneath the tracks and opens onto the station hall. There is also a separate underpass to give pedestrians access to the recreational area of El Coto de la Isleta.




AVE high-speed line between Seville and Cádiz

The high-speed Seville/Cádiz line extends the high-speed Madrid/Seville corridor to Cádiz, as called for in the Strategic Plan for Infrastructure and Transport.

# Opening of the Fundación Barredo's bioclimatic building

The 24 November saw the opening of the new facilities in the Fundación Barredo's bioclimatic building, which houses the head offices of the Tunnel Fire and Ventilation Research Centre in San Pedro de Anes, Siero, Asturias.

The event was attended by, amongst other personalities, Secretary of State for Research Carlos Martínez Alonso; President Vicente Álvarez Areces of the Principality of Asturias; head of the Regional Industry and Employment Department, Graciano Torre; the mayor of Siero, Juan José Corrales; the director-general of Planning and Coordination at the Ministry of Science and Research, Juan José Moreno; the director-general of the Energy, Environmental and Technological Research Centre, Carlos Martínez Rodríguez; the director-general of Mining and Energy, Isaac Pola; and the manager of FCC Construcción's Northern Office, Javier Hidalgo González.

The building is one of the first of a series of container/demonstration buildings located in different climates throughout Spain for Arfrisol, a plan of research into bioclimatic architecture and solar cooling. The Arfrisol project is coordinated by CIEMAT, the Ministry of Science's Centre for Energy, Environmental and Technological Research. It is an ambitious plan that seeks to raise awareness of the need to design buildings that reduce energy demands and use alternative systems for heating, cooling and electricity production.

The objective of this type of facility is to prove that it is possible to save from 80 to 90% of conventional energy by using bioclimatic design and construction criteria. The facilities are located in Siero because the area receives a high amount of rainfall and has mild winters and summers, where the differences between diurnal and nocturnal temperatures are low.

Because of this cunning combination of design, materials and facilities, only between 10 and 20% of the energy the building needs will be conventional energy. In addition, under its foundations the building has got pipes for cooling the hot water from the absorption heat pumps and 68 sensors installed on the pipes and in the ground to control temperature.

The building has got a useful area of 1,475 square metres. This includes offices and outdoor spaces. There are three floors.

To generate heat, this building uses its solar thermal panels and biomass furnace. To cool, it has, instead of a traditional compressor system, a heat absorption system that uses not the electricity the compressor method uses, but the calorific energy

Aerial view of the Tunnel Fire and Ventilation Research Centre, San Pedro de Anes. Fundación Barredo.

obtained for free from the solar thermal panels. The building also includes a geothermal exchanger, used as a condenser in the cooling system, and photovoltaic solar panels to generate electricity for the building's own needs.

To combine the operation of all these systems and strategies, the building boasts a sophisticated centralised control system, which can assign priorities to the operation of certain facilities in order to pare energy consumption to a minimum, and a self-monitoring system so that the energy savings achieved through the use of these strategies and renewable energy sources can be quantified.

One of the bioclimatic features is a glassed-in gallery designed to take full advantage of all sunlight that enters the building, and equipped with motorised shutters.

This building's main characteristic is that here an attempt is made to combine a larger number of strategies and renewable energy sources in order to achieve a really significant improvement in energy savings in the building's construction and use.

**Budget of the awarded contract with VAT:** 2,987,235.50 million euro

**Client:** Fundación Barredo

**Architectural supervision team**

**Managing architects:** Emilio M. Mitre y Carlos Expósito Mora

**Project execution manager:** José Antonio Menéndez Quirós

**Site Team**

Department head: Aurelio Vega

**Construction manager:** Ramón Cortina Iglesias

**Production chief:** José M. Fernández

**Office staff:** Verónica Crespo

**Foreman:** Pablo C. Menéndez

**Surveying:** D. Antonio Anes

**Quality and environment technician:** Miguel A. Puerma

# FCC Construcción opens I-95 Express Lanes in Miami

On 2 December 2008 the first phase of the I-95 Express Lanes project was opened.

The act was presided over by the secretary of the Florida State Transportation Department, Stephanie Kopelousos, and boasted the attendance of Gus Pego, secretary of Florida State Transportation Department District 6, Kerry O'Hare, deputy administrator of the Federal Highway Administration, Mario Diaz-Balart, congressman for Florida's 25th congressional district and member of the Transportation and Infrastructure Committee, and Ysela Llort of Miami-Dade County. On FCC's behalf, attending the event were Pedro Chaves, manager of the North American Office, Eloy Sánchez-Cid, construction manager of FCC Construction, Inc., and Jesús M. de la Fuente, technical manager of FCC Construction, Inc.

Everyone involved in the presentation stressed how important the start-up of the project was for traffic in the Miami metropolitan area.

With the start-up of the first phase, the northbound roadway, drivers can choose between toll-free lanes and the two HOT (automatic toll) lanes. To use these barrier-free toll lanes, users will have to have a device called the Sunpass, which is automatically read, enabling motorists to pay automatically without having to stop at a toll gate.

The project, which has a budget of 121.5 million dollars, includes the widening of the roadways in both directions for 19 miles along highway I-95 in the Miami metropolitan area, so that instead of one HOV (high-occupancy vehicle) lane, there will be two HOT (automatic toll) lanes, with the same number of toll-free lanes as before (three in some sections and five in others). The contract also includes the installation of ITS (Intelligent Transportation System) communications systems and the toll systems, plus the enlargement of several existing structures in the area of the main junction, work to connect the different junctions and the construction of new road surfaces.

The two-part project will continue with Phase 1B, which includes the work on the southbound I-95.

# Water Is Not Alone. Dynamic hall at CONAMA 9

Water Is Not Alone is the title of the dynamic hall FCC organised as part of the activities that took place at the Ninth National Environment Conference on 1 December at the Municipal Congress Hall at Madrid's Campo de las Naciones fairgrounds.


From left to right, J.M. Roncero, Roque Gistau, Baldomero Falcones, Manuel Marín, Marcos Vaquer and Manuel Sagastume

Water as a resource and its sustainable management were the central topic of this debate, which was moderated by Manuel Marín González, former speaker of the Chamber of Deputies. The following speakers participated: Baldomero Falcones Jaquotot, chairman of FCC; Roque Gistau Gistau, chairman of Sociedad Estatal Expo 2008; José María Roncero Garrido, president of the Union of Consumers of Spain; Manuel Sagastume Ruiz, president of the Basque/Navarran Association of Architects; and Marcos Vaquer Caballería, chairman of SEPES and undersecretary for Housing.

Water has become an increasingly rare, increasingly valuable resource.

Baldomero Falcones stressed that FCC has had a commitment to sustainability for many years now, a commitment that is closely linked to FCC's way of doing business. We are getting things done by providing technological innovation, respecting the environment and investing in training so we can rely on having the best professionals.

Marcos Vaquer spoke about the relationship between soil and water and the need for a cultural shift. In recent years soil policies have been evolving without a view to hydrological needs.

Roque Gistau asserted that we stand at a unique and delicate fulcrum point: "Spain has been a model for water management in hydrographic basins, a model that has been applied in Europe". One important point he stressed was the need for a regulating authority to set quality objectives. He insisted on the need to support and improve the system so that it can become exportable, and to import culture, after first defining the model we want to implement.

Manuel Sagastume said that in Spain we need to reach a vast water compact and put that compact into legislation for the comprehensive management, distribution and efficient use of water.

José María Roncero spoke about the water problem, a hot topic of debate for the different political formations. In his speech he underlined the need to take more-responsible attitudes and to adopt a new culture of water utilisation based on rational use. Water must be distributed based on fundamental priorities:

- Water in quantity and quality for citizens
- Environmental friendliness
- Water for agriculture and industry (Approximately 9% of all water distributed is for human consumption, 22% is for industrial use and 69% is for agricultural use).

He concluded that we are a privileged society because we have water. Water is for everybody, but not for everything.

Manuel Marín asserted that there was no denying the importance of water, and that there is a general commitment concerning sustainability. "Spain has got to manage diversity through combinatory solutions. However, we talk about 'water' as an absolute category, and we ought to be talking from a more flexible standpoint, looking for combined solutions that address our needs."

# CSR in introductory training

The Organisational Training Course for Technicians is an introductory course designed to help new hiree technicians become better integrated into the firm. In 2008 the course was given nine times, for a total of 174 participants.

The course covers company organisation and procedures, quality, environmental management, occupational risk prevention, public and private works contracting, machinery, procurement, technical and economic planning and the SIE economic information system.

Since October a one-hour-long session on sustainability has been included, taught by the Quality and Training Management Office and the Institutional Relations Management Office.

The idea behind the session is to show participants that FCC Construcción is working hard to be a company that creates value through its business activity, a company that takes care of people, the environment and the community where it does business, and a company that understands that sustainability has got to form part of its strategy. The session looks at the following issues:

1. Sustainability not only as a way of introducing the concept of ethics into the business world, but also as a survival strategy for companies.
2. Corporate social responsibility, which makes us aware that commercial success and lasting profits are not earned only by short-term profit maximisation, but instead by behaving in a way that is market oriented yet responsible. The FCC Group's CSR Master Plan and CSR Strategic Lines are discussed as well.
3. Existing policies at FCC Construcción: quality policy, environmental policy, occupational risk prevention policy, customer policy, employee policy, supplier policy and R+D+i policy.
4. Interest groups and their economic, social and environmental concerns.
5. Communication tools. Sustainability report, environmental communication.

Students learn that following the path of sustainability we are helping to build our future. In short, they learn that social responsibility is not altruism; it is a survival strategy.

# Madrid Civil Engineers Give Awards to Two Railway Jobs by FCC

## The extension of Madrid Metro Line 3 and the Guadarrama Tunnels

The Professional Association of Civil Engineers, Madrid Division, has given its annual awards to two jobs by FCC Construcción, the extension of Madrid Metro Line 3 and the Guadarrama Tunnels on the high-speed railway line to northern and north-western Spain.

In the first of the jobs, which consisted in extending Line 3 from Legazpi to San Cristóbal de los Ángeles and from San Cristóbal to Villaverde, the Puerta del Sol station and the Moncloa station and intermodal transfer facility, the Professional Association of Civil Engineers stressed the work done by Avelino Acero, Ricardo Gil Edo and Joaquín Arroyo. For the Guadarrama Tunnels, the award-givers stressed the job done by Joaquín Roura.

Metro line L3, Madrid

# FCC Construcción has filed its 2007 Progress Report

## The previous edition received acknowledgment from the United Nations

FCC Construcción has filed its 2007 Progress Report, using the standard form prepared by ASEPAM (the Spanish Global Compact Association). In the report FCC describes its actions, results and objectives with respect to each of the Ten Principles of the Global Compact.

This information is public and is now available at ASEPAM's web page, www.pactomundial.org.

In addition to releasing its annual report, FCC Construcción has ratified its voluntary commitment to the Global Compact. For its last report, the company received a letter from the Global Compact acknowledging the report's quality and mentioning that it could serve as an example to other participants. For this reason the Global Compact gave us a special acknowledgement on its web page, posting our report in the section entitled, "Notable Communication on Progress".

http://www.unglobalcompact.org/COP/notable_cops.html?submit_x=page&pc=10&pn=5

There have only been six European companies acknowledged as NOTABLE, being Spanish three of them: Javierre, OHL and FCC Construcción.

THE GLOBAL COMPACT
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# Gas Natural's managing director attends the start of FCC Construcción's work on the Baztan-Bidasoa gas pipeline

From left to right: Antonio Peris, managing director of Regulated Business at Gas Natural; José María Roig, head of the Innovation, Enterprise and Employment Department; Gas Natural Transport Project Manager Javier Lara; Mayor Miguel San Miguel of Santesteban; Mayor Virginia Alemán of the Baztán Valley and Angén Boíllos, managing director of Gas Navarra.

On 28 November last the head of Navarra's Regional Innovation, Enterprise and Employment Department, José María Roig Aldasoro, attended the official ceremony to mark the start of construction work on the Baztan-Bidasoa gas pipeline, which took place in Santesteban. Accompanying Mr Roig at the event on behalf of Gas Natural were Managing Director of Regulated Business Antonio Peris, Distribution Manager José María Almacellas, Transport Project Officer Javier Lara, North Zone Expansion Manager Jesús López de Andrés and Gas Navarra's managing director, Ángen Boíllos. Also attending were the managing director of Auxiliar de Pipelines, Eduardo Yges Peña, technical experts from the Navarran regional government and town council representatives from the localities in the Baztan, Malerreka, Bertizarana and Bortziriak valleys who will be benefiting from this infrastructure.

Auxiliar de Pipelines, S.A., will build the 33.5-kilometre-long pipeline that will join the localities of Lesaka and Elizondo, taking advantage of the old Bidasoa railway route. Completion is scheduled within an estimated 200 working days, with an average of around 175 metres of pipe being laid per day. The gas pipeline is being put in on the left bank of the Bidasoa River and will have four regulator stations plus gas distribution networks and mains for the different localities. It will enable over 2,400 families and several businesses in the district to receive natural gas. The anticipated investment for the gas project is 8.7 million euro.

# The managing director of ENAGAS, S.A., attended the start of work to place pipes in the Balearic Island underwater gas pipeline

On 25 November last the managing director and the project and construction manager of Enagás, S.A., Antonio García Mateo and Juan Andrés Diez de Ulzurrun Moreno, accompanied by the manager of the joint venture, Eduardo Yges Peña, attended the start of the work to place pipes in the Ibiza microtunnels.

UTE Baleares DOS, a joint venture by Italian firm Saipem S.p.A., FCC and Auxiliar de Pipelines, S.A., is the company in charge of landing work at the points where the pipes enter and exit at Denia, Ibiza and Mallorca.

A ship, the Castoro Sei, arrived at the Ibiza coast on 23 November last to do the work. The Castoro Sei has a width of 152 metres and a beam of 70.5 metres and rises 30 metres above the sea.

In December the 145 kilometres of pipe between Sant Antoni de Portmany and the Sant Joan de Dios station on Mallorca were laid, running as deep as 718 metres maximum, and in January 2009 pipe will begin to be laid between Ibiza and the peninsula; this will involve installing a total of 123 kilometres of pipes at depths of up to 997 metres. The pipe will be 20 inches in diameter, and the anticipated design pressure is 220 bar. At both Ibiza and Mallorca valve positions will be built for the delivery of natural gas to the distributor. The pipeline's total budget is 490 million euro, and work is scheduled to be completed by June 2009.

It is anticipated that the maximum flow the system will carry to Mallorca will be 676,000 cubic metres, which will arrive at a pressure of 80 bar. This is enough capacity to accommodate four times more than the current consumption rate.

The project to bring natural gas to the Balearic Islands is attuned to the energy model championed by the European Union. With the arrival of natural gas, the islands will be brought into the larger Spanish gas system and will therefore enjoy an improvement in the reliability of their supply. What is more, once end users in the Balearic Islands have gained access to piped natural gas, they are guaranteed that the price they pay will be the same as the price charged to the rest of Spain's citizens.

# Madrid 2016 at www.fccco.es

FCC has joined the programme sponsoring Madrid's candidacy to host the 2016 Olympics.

Since December FCC Construcción has featured the Madrid 2016 logo on its www.fccco.es web page, together with a direct link to www.madrid2016.es.

This is just part of the set of commitments the company has shouldered as a preferred sponsor of Madrid's Olympic candidacy.

Madrid has made it past the International Olympic Committee's first cut-off, together with another three cities, and it has become an official candidate to organise the 2016 Madrid Games. Its rivals are Chicago, Tokyo and Rio de Janeiro.


# TBM sets record on metro line to Barcelona airport

Metro line L9, Barcelona

Catalonia's Generalitat, or regional government, acting through the government-owned company Ifercat, gave the 30-year public works concession contract for the construction, upkeep, maintenance and operation of various pieces of infrastructure on section I of line 9 of Barcelona's metro to FCC in a joint venture with other firms in October. The contract is worth 1,041 million euro, 630 million of which are for the work that still remains to be completed.

The section consists in 13 stations that go from El Prat Airport to Amadeu Torner.

Two tunnel-boring machines dubbed Hades and Guster have set records on this job:

- Best working day (1 day) for an EPB TBM 9.01 metres to 10.00 metres in diameter: 43 rings/day (64.5 metres/day) by S-279 Hades on 6 December 2008, and matched on 8 December 2008, in the Mas Blau/Parc Logistic section.

- Best weekly production (the best consecutive seven days of production) by an EPB TBM 9.01 metres to 10.00 metres in diameter: 231 rings/week (346.5 metres/week) by S-279 Hades from 6 December to 12 December 2008. Mas Blau/Parc Logistic section.

- Best monthly production (the best consecutive thirty days of production) by an EPB TBM 9.01 metres to 10.00 metres in diameter: 685 rings/month (1027.5 metres/month) by S-461 Guster from 30 October to 28 November 2008. Mas Blau/Airport section.

So far 22.9 kilometres of the 47.8 kilometres of line 9 have been built, and 75% of the stations are under construction. Line 9 will become fully operational sometime between 2013 and 2014.

# FCC and BBR at the Fourth ACHE Conference

Diana Cobos, project manager BBR

ACHE, the Scientific and Technical Association for Structural Concrete, held its fourth conference at the Palacio de Congresos conference hall in Valencia on the 24 to 27 November 2008. ACHE conferences are held every three years to bring together experts in designing, calculating and executing all kinds of structural concrete projects.

FCC's Technical Management Office gave six presentations, on the following topics:

- The Navia Viaduct, a project that included the design and construction of a 905-metre-long viaduct with two 160-metre-long arching spans. The viaduct was built using segments precast with technology developed by FCC and BBR hangers.

- The Las Salinas Viaduct. A description was given of the design and construction of the viaduct with its 113-metre span, built using the progressive cantilever system.

- New Mestalla Stadium. A description was given of the construction procedure and the building solutions used to erect this stadium for 73,000 spectators. Stress was laid on these factors: the industrialisation of concrete, the handling of joints and prefabricated parts and the organisation of special auxiliary resources.

- Torre Quadrat, in Panama: A 155-metre-tall, 37-story residential tower. Structure of concrete slabs with unbonded post-tensioning tendons. Central core resistant to horizontal action (wind and seismic movement) and pillars around the perimeter.

- The Museum of Royal Collections in Madrid: A pile wall has been built to withstand the thrust of Almudena Cathedral and the Royal Armoury while excavation work is done to create a drop-off over 35 metres deep. The wall is made of piles 1.50 metres in diameter and 45 metres long, with seven levels of anchoring points.

- Torre Cajamadrid. This is a 250-metre-tall building, with 34 stories of offices in three modules, each of which is held up by a lattice of trusses resting on two reinforced-concrete cores. Some unusual construction solutions were employed in its construction, such as self-climbing systems for the cores, high-rise concrete pumping, movement of extraordinarily heavy metal parts, huge bolted joints, strongly reinforced post-tensioned slabs and heavy-lifting procedures for the building's crown.

Several projects FCC built were also presented by their respective designers. Foremost among these were the bridge over the Danube at Vidin, Bulgaria, the Basarab Viaduct and Centura Viaduct in Bucharest, Rumania, the Manzanal del Barco Bridge, the C.D. Español football stadium and the Magic Box in Madrid.

J.I. González Esteban took part in a round table, giving a presentation on the industrialisation of viaducts. At the round table on current affairs in infrastructure construction in Spain, Fernando Pedrazo, head of the Planning Area at the Ministry of Development, presented the Navia Viaduct as one of the six most noteworthy bridges built in recent years.

BBR PTE was at the conference as well, with three presentations on post-tensioned concrete projects. It also had a built-in stand where technical information about our solutions was on offer to conference goers, including information on our filing for ETAG 013 European approvals for our CMI bonded internal post-tensioning system, our CMM unbonded internal post-tensioning system, our CME bonded external post-tensioning system and our CMB unbonded external band post-tensioning system. The BBR HiAm CONA systems of parallel strand stay cables, which meet the latest fatigue requirements, and the variation for extradosed tendons, HiEx CONA, the DINA parallel wire system and other company activities (incremental launching of bridge decks, incremental jacking of caissons, heavy lifting, slipforming system, post-tensioning bar systems, rebar coupling system, etc.) were also presented.

The presentations BBR PTE gave were these:

- Torre Caja Madrid. Application of post-tensioning technologies. The heavy lifting operations needed to lift the skyscraper's crown structure into place were also presented.

- Post-tensioning jobs in the construction of the storage and regasification plant at the LNG terminal in the Adriatic, a GBS structure made in Algeciras and towed by sea to its final site in the Adriatic off the coast of Venice. Job size was an important consideration here (over four million kilograms of post-tensioning), as were the quality and off-short durability requirements, for which, among other things, new injection processes were developed for extra-long vertical and horizontal tendons.

- Parallel strand stay cables. Bridge over the Seco River. The process of installing HiAm CONA stay cables proved quite compatible with all the project's other activities, making it possible to reach high rates of progress. The cable-stayed Serrería Bridge was also presented, where friction dampeners were installed for most of the stay cables.


BBR's stand