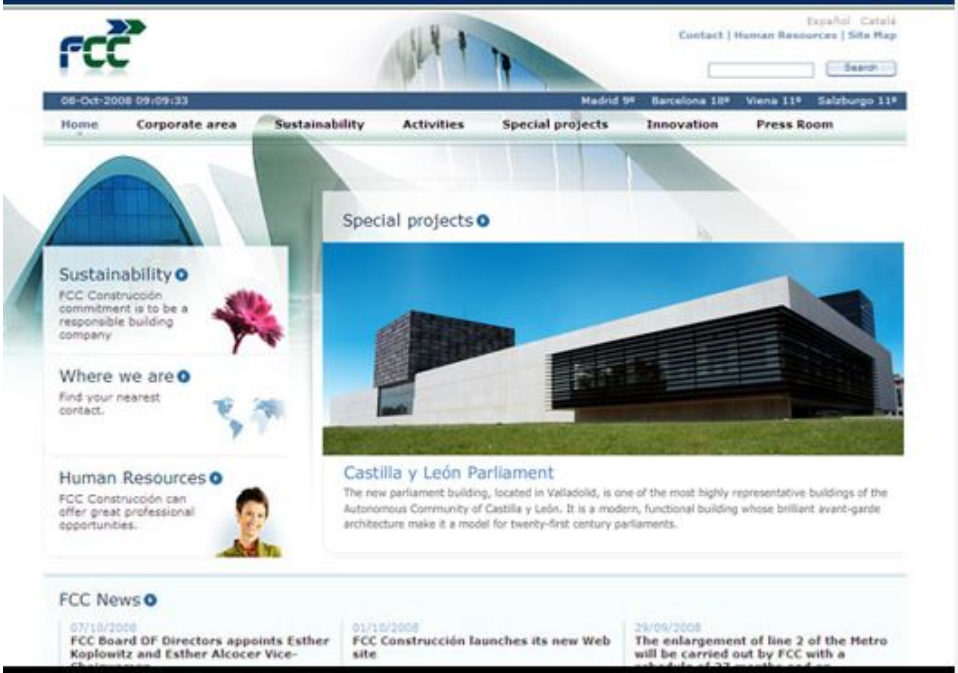

FCC Construcción´s new Web site

Events

- Cornerstone laid at the Tito Bustillo Cave Art Centre in Ribadesella, Asturias.
- Integration of the railway line into León and San Andrés de Rabanedo.
- Cornerstone laid at development work at Lloreda Business Park, Gijón, Asturias.
- Construction at Barcelona University's School of Biology.
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- Hospital in Ireland.
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- Enlargement of Getafe Air Base in Madrid.
- Plasencia-to-Portugal section of dual carriageway EX- A1.
- Conduit replacement project from Beas Reservoir to El Conquero Wastewater Treatment Plan in Huelva.
- Refurbishment of Canary Island Museum headquarters.
- Refurbishment of Teatro Coliseo Carlos III.
- Enlargement of line of the Metro de Madrid.
- High-speed railway tunnel in Madrid.

Other contract awards

- Two office buildings at the Adecua business park for Bami, in an 18-month completion period.
- Social integration centre in Murcia for Sociedad Estatal de Infraestructuras y Equipamientos Penitenciarios.
- New Civil Guard Barracks House in Calvià, Mallorca, for the Ministry of Home Affairs' Directorate-General of the Police and the Civil Guard.
- Sewage mains and rerouting of the outer catchment areas along carretera del Copero and calle Termas in Seville's La Isla Industrial Polygon, for Empresa de Gestión Medioambiental (EGMASA).

Jobs in progress

- Bodegas Protos

ALPINE

- ALPINE uses a helicopter to assemble a bridge in Austria.
- ALPINE finishes work on Lainberg Tunnel along the A9.

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Contract awards

FCC to build a hospital in Northern Ireland and operate it for 30 years

Computer graphic.

The Northern Ireland Health Group Consortium, in which FCC Construcción holds a majority 39% share, has been declared the preferred bidder by the Western Health and Social Care Trust, the organisation in charge of awarding the contract for the concession for the design, construction, financing and operation of the new Enniskillen hospital in southwest Northern Ireland.

The announcement came after a two-year competitive dialogue with not only the group led by FCC but also another two groups, one headed by the Swedish builder Skanska, and the other, by the British construction firm Balfour Beatty. After this announcement, all that remains is to close on the project's financing and sign the contract, a process that is expected to be completed in the first half of 2009.

The New Acute Hospital for the South West, as the facility will be called, will take an investment of 267 million pounds (some 335 million euro) and three years to build. It will have 315 beds in single rooms covering an area of over 60,000 square metres, and it includes a worker-housing building and an energy demand management centre, making it one of the most modern buildings in Europe in terms of energy efficiency, as it will need one-third less energy to run than other, similar facilities.

The project is characterised by the high quality standards required by the client, including comfort for patients as well as visitors and employees, ease of facility use, visual impact, integration in the surrounding landscape, energy efficiency and integration into the district's socio-economic relations. The hospital is designed as three bands, or lines of blocks, separated by linear gardens and courtyards, so it optimises the use of natural light and ventilation in addition to facilitating a constant visual relationship with the environment.

The contract includes, in addition to the design and construction of the new building, certain non-health-related support services, energy control, maintenance and management of the facilities' life cycle.

This hospital is the first to be awarded in Northern Ireland as a concession, and it falls within the framework of the plan to improve hospital infrastructures. As part of the plan, the new Omagh hospital is now in the bidding phase, and the consortium led by FCC Construcción is preparing a bid.

FCC Construcción is awarded a new contract in Honduras

The Honduran government has awarded M&S, FCC Construcción's subsidiary in Central America, the contract to build section 2 of the south segment of road CA-5 in Comayagua, Honduras, in a 24-month completion period with a budget of 39.6 million euro.

The south segment, which threads through a mountainous region, is 33.3 kilometres long. The project calls for the improvement and replacement of existing drainage and the construction of a change of alignment between kilometre point 43+300 and kilometre point 46+600 to accommodate the traffic driving up from the Comayagua Valley.

The northern CA-5 is 294 kilometres long. It is part of the Honduran section of the Atlantic corridor, which channels most of the country's import and export traffic between Puerto Cortés and the main production centres, San Pedro Sula, Comayagua and Tegucigalpa. It bears approximately 23% of all of Honduras' road traffic by volume.

The refurbishment and improvement of this road will give this region, a hub of tourist, recreational and urban development, a safe, efficient overland route for communication.

FCC is awarded the construction of the Constanza bypass

The Romanian National Road Administration has awarded FCC, in a joint venture with an Italian firm, the contract to design and build the Constanza bypass for 141.8 million euro inside a 32-month completion period.

The new 22-kilometre-long road lies west of the city. It includes five interchanges, two 3.75-metre-wide lanes in each direction, a four-metre-wide median, a three-metre-wide emergency lane and 26 structures (six viaducts, six bridges, eight overpasses and six underpasses).

Most of the bypass is to be built on embankments erected on top of loess. One special feature of the project is that it requires the construction of 755 kilometres of vibro-compacted soil columns, 0.38 metre in diameter and six metres deep, in embankments standing over five metres tall.

Other projects in Romania

FCC Construcción and its Austrian subsidiary ALPINE are currently involved in some major infrastructure projects in Romania, the foremost of which are:

FCC

• Construction and expansion of roads DN1C Livada-Dej-County Limit Cluj; DN 66 Filiasi-Petrosani, and the northern circuit of the Bucharest ring road, which includes a 240-metre-long cable-stayed bridge.

• Efurbishment of 30 kilometres of road DN1C, in Cluj-Livada, northern Romania.

• Construction of a bridge over the Danube that will connect Bulgaria with Romania, plus the bridge's accesses.

• Widening and upgrading of the 52.2-kilometre-long

Timisoara-Lugoj section of national road NR6.

• Construction of the Basarab viaduct, northeast of Bucharest.

ALPINE

• General renovation of the northern section of the Bucharest ring road and the main access road to the city from the west, a total of some 13 kilometres.

• Two environmental projects for the installation and sanitation of two dumps and the construction of two water-purifying stations.

• New central corporate offices for Petrom, southeast Europe's biggest oil and gas producer.

FCC Construcción's portfolio of jobs in Romania is worth over 500 million euro. To this sum can be added the jobs signed up by ALPINE, which contribute an extra 200 million euro to the total.

AENA awards FCC the contract to enlarge Getafe Air Base

AENA has awarded FCC the contract to enlarge the southern apron at Getafe Air Base, in Getafe, Madrid, with a budget of 13.9 million euro and a completion period of six months, so that the civil aviation traffic at Torrejón de Ardoz Air Base can be shifted to Getafe.

The new apron will have an area of 65,000 square metres and has been designed to afford a total of 68 parking slots. The work includes the urban development work for a future 13,800-square-metre terminal area and access roads taking off from a road that runs parallel to the base fence. Auxiliary facilities for fuel and fire fighting are also to be built.

FCC Construcción is awarded a section of dual carriageway EX-A1 from Plasencia to Portugal

FCC to build the section from El Batán to Coria, Cáceres, in 28 months for 38.8 million euro

The Department of the Ministry of Public Works has awarded FCC Construcción, in a joint venture with another company, the contract for a new section of the EX-A1, the dual carriageway that will be connecting Plasencia with the Portuguese border. This road, which will run from El Batán to Coria, in Cáceres, is 10.6 kilometres long, will take 28 months to complete and has a budget of 38.8 million euro.

The new dual carriageway will lie parallel to existing roads EX 108 and EX 109. It will have two 3.50-metre-wide lanes, a 2.50-metre-wide outer verge and a one-metre-wide inner verge. It will also have two junctions, at kilometre point 5.170 for access to La Puebla de Argeme, and at kilometre point 9.681 for access to east Coria; and it will have thirteen structures in all, including three viaducts.

FCC is awarded the project to replace the intake conduit from Beas Reservoir to the El Conquero Wastewater Treatment Plant in Huelva

Hidroguadiana, S.A., has awarded FCC Construcción the contract to replace the intake conduit from Beas Reservoir to the El Conquero Wastewater Treatment Plant in Huelva. The 28.1-kilometre-long project will be completed in 18 months with a budget of 11.8 million euro.

The project is designed to improve the current obsolete water supply infrastructure of Huelva, which is losing significant quantities of water due to leakage. The line runs through Beas, Niebla, Trigueros, San Juan del Puerto and Huelva. It currently relies on gravity to make the water flow. Plans are to increase the volume from 13,000 m3/day to 25,000 m3/day.

There are four different sections involved. The first section is a 2,230-metre-long canal; the second, a 2,323-metre-long tunnel; the third, a 1,469-metre-long stretch of concrete pipe; and the fourth, 22,106 metres of polyester pipe.

FCC to refurbish Canary Island Museum headquarters

The Canary Island Museum Scientific Society has awarded FCC Construcción the contract for the first phase of work to enlarge and refurbish the Canary Island Museum, located in Las Palmas de Gran Canaria. The project was designed by architects Fuensanta Nieto de la Cierva and Enrique Sobejano García.

The museum has got a multitude of items from the pre-Hispanic cultures that inhabited Gran Canaria, and it focuses on preserving, researching and exhibiting its archaeological collections and document collections. It has got a library, a newspaper archive and a document archive, all specialising in Canary Island subjects, and it provides services for researchers, students and anyone interested in consulting its array of materials.


Front of the Canary Museum.

Over its long career, the Canary Island Museum Scientific Society, established on the 2 September 1879, has won the unanimous recognition and respect of the Canary Island people, scientists the world over and the numerous visitors who cross its threshold daily to visit its halls and conduct research.

FCC Construcción to refurbish the Teatro Real Coliseo Carlos III

The Directorate-General of Architecture and Housing has awarded FCC Construcción the contract to refurbish the Teatro Real Coliseo Carlos III, a historic theatre building in the heart of historic Aranjuez, Madrid. The work will take 26 months to complete and cost 5.8 million euro.

The theatre's refurbishment and restoration project was designed by Bayón, Arquitectura y Urbanismo, and it is based on the original mid-18th-century design, preserving those historical elements that still remain from the original building.

This unique theatre, built in 1769 and designed by Jaime Marquet, has undergone several improvements throughout its history, with the ensuing changes in its original structure. It was even turned into a cinema in 1933.

The enlargement of line 2 of the Metro will be carried out by FCC with a schedule of 27 months and an investment of €157 million

The Madrid regional government has awarded the lengthening of line 2 of the Metro from La Elipa to Las Rosas to FCC Construcción in a temporary joint venture with other company, with a schedule of 27 months and a budget of €157 million.

This will be a new underground section 4 .5 km long with four new Metro stations to benefit 65,000 persons.

The route will start in the Bilbao district where the first session will be located facilitating access to the Almudena cemetery. From there the tunnel will continue under Nicolás Salmerón Street until it reaches the second station, then travelling Avenida de Guadalajara to the third station at the crossover between Avenida de Canillejas and Vicálvaro and finally crossing the M40 to reach the Paseo de Ginebra, where the fourth station will be located.

All the stations will have 90 m long platforms with access for the disabled.

FCC wins the contract for the high-speed railway tunnel in Madrid for €206 million

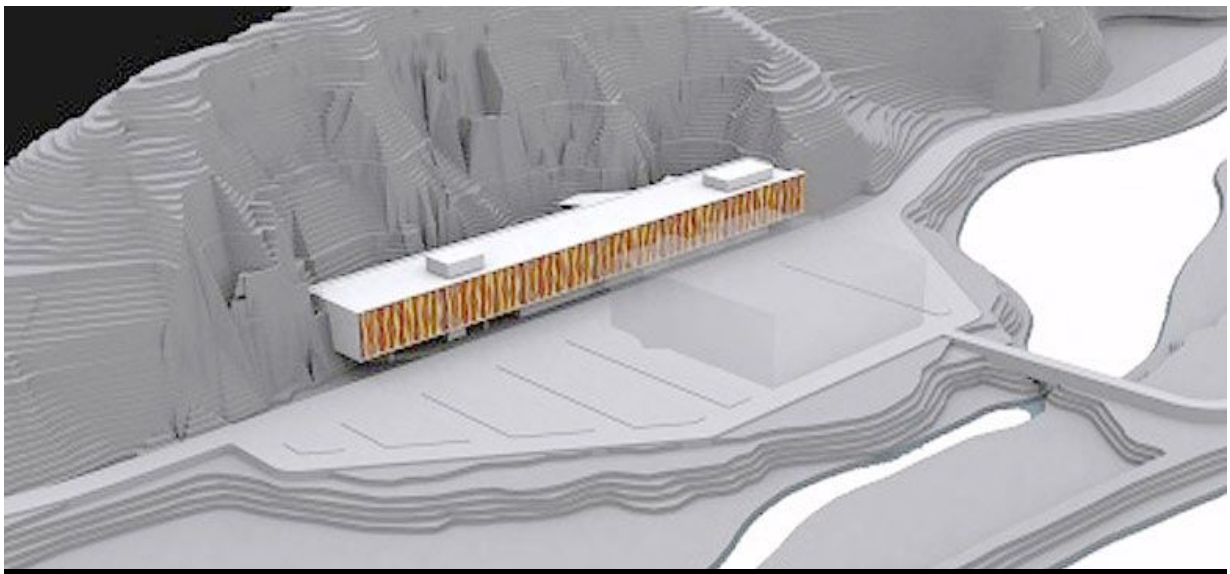
The Ministry for Development has awarded the building of the high speed rail track and tunnel connecting the stations of Atocha and Chamartín to FCC in a temporary joint venture with other companies. The budget is €206 million with an undertaking schedule of 32 months.

This section of new route has double international gauge track and is 7.33 km long, of which 6.9 km are underground. It will start in Méndez Álvaro Street, followed by Alfonso XII street and passing under Serrano Street to the República Argentina Square where it will then follow current urban planning regulations with a new track between Francisco Suárez and Mateo Inurria streets until it reaches the southern head of Chamartín station.

The project also includes building of the track and remodelling the sidings at the southern head of Chamartín station. Most of the route, approximately 6 km, will be built with an EPB tunnel boring machine with an excavation diameter of 11.4 m at a depth of some 40 m so that the building work will not affect the life of the city too much.

Events

Work starts at the Tito Bustillo Cave Art Centre in Ribadesella, Asturias



Computer graphic.

The new cave art centre will be located in the city of Ribadesella, just a stone's throw from the Tito Bustillo Caves, which were recently declared a World Heritage site.

On the first of August last the cornerstone was laid for the Tito Bustillo Cave Art Centre in Ribadesella, Asturias. The ceremony was attended by the president of the Principality of Asturias, Vicente Álvarez Areces, who was accompanied by the national government's deputy in Asturias, Antonio Trevín, the councilwoman in charge of culture and tourism, Encarna Rodríguez Cañas, Director-General of Cultural Heritage José Adolfo Rodríguez Asensio, and Ribadesella's mayor, Ramón Canal Tirador.

The building will be located in the old Concurbión Quarry on the left-hand bank of the Sella River. It will house an information and study centre focusing on the life and art of Tito Bustillo Cave. The quarry forms the visual background of the building, which clings to the quarry as if it were a girder shoring up the old mass of rock and buttressing the mountain.

The building has been envisaged as a three-level complex a total of 4,274 square metres in area. The ground floor, where the entrance is, houses the areas open to the public, which are the lobby and reception area, a store, a coffee shop, a library and a set of lecture rooms. This level of the building is conceived as a see-through glass box, so as never to block the view of the mountain from the road.

The floor above that is a great dark box containing the exhibit spaces. This prism-shaped volume seems to literally lean against the mountain, and it is actually a staging area equipped with modern audiovisual and information graphics technologies for preparing exhibit spaces and virtually restoring Tito Bustillo Cave. The work spaces off-limits to the public are in the basement.

BASIC INFORMATION

Job name: Tito Bustillo Cave Art Centre.

Developer: Culture and Tourism Department.

Budget: €6,173,231.

Completion period: 17 months.

FCC is handling the work to integrate the railway line into León and San Andrés de Rabanedo

Because of León's strategic location in the railway system, numerous facilities have sprung up in the city and its environs, occupying quite a large area of land. Their sprawl and the railway line's route itself have been hampering not only urban development in León and San Andrés de Rabanedo, but also communications between the two cities.

To solve the problem, the Ministry of Development has rolled out a number of actions aimed at integrating the railway more smoothly into León and San Andrés de Rabanedo, actions that FCC is engaged in implementing. They include the construction of León's southern railway junction, the upgrading of the line to accommodate high-speed trains, the construction of the Onzonilla logistics centre, the remodelling of the railway's path through the city and the construction of a new passenger station in León.

To get all these actions done, the line has had to be rerouted to stop trains from running right through the city, and to do this a junction connecting all the railway lines that converge in León has been constructed south of the city. This junction consists of two branch lines connected to each other. One is 3.1 kilometres long, and the other, 2.8 kilometres long.

With this new León railway junction open, scheduled actions can be continued, as a solution will have been found for the problems the railway line and railway-related facilities were causing, a solution that will furthermore free up large pieces of ground that can now be put to citizen use.

Cornerstone laid at Lloreda Business Park

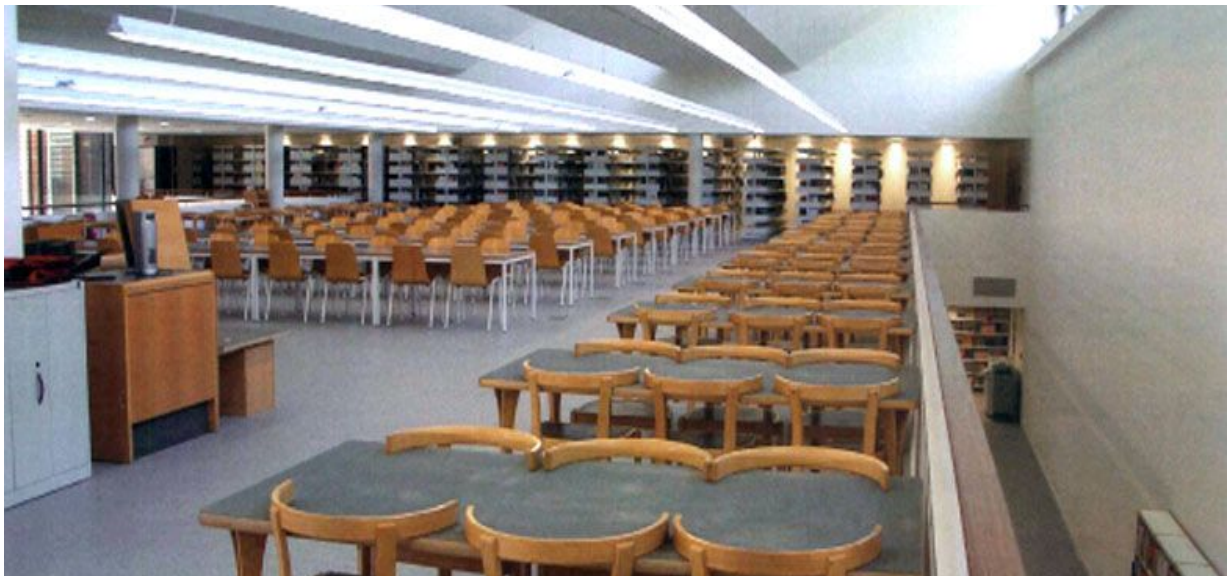
The councilman in charge of infrastructure, Francisco González, the councilman in charge of industry and labour, Graciano Torre, and the mayor of Gijón, María Paz Fernández, in the cornerstone ceremony.

On the 5 August last the cornerstone was laid for Lloreda Business Park in Gijón, Asturias, witnessed by the councilman in charge of infrastructure, Francisco González Buendía, the councilman in charge of industry and labour, Graciano Torre, and the mayor of Gijón, María Paz Fernández Felgueroso.

Lloreda Business Park has got a gross area of some 984,519 square metres and a gross building area of 789,259 square metres, which gives a net industrial parcel size of 497,781 square metres. Of that, nearly 238,000 square metres will be set aside as parcels for SMEs, over 233,000 will be for large industrial facilities and 26,500 will be for urban production activity.

The development of the area is being approached as a response to the need to provide the Gijón municipal area with short-term industrial land.

FCC enlarges the library at the Barcelona School of Biology



FCC was the company chosen to enlarge the library at Barcelona University's School of Biology. The building is seen as the nexus joining two phases of construction that have already been finished at the school.

The project calls for a roof that, almost like a pedestrian square, will be mostly traversable and will hold the main entrance to all the school's buildings. There are three underground floors. The first and second are for study and reading areas, auxiliary classrooms and book storage. On the third floor is a car park connected to the existing building's car park. All in all there are 5,900 square metres of floor area.

There is a series of courtyards and long windows that furnish natural light for the two stories where students will be reading and studying. These stories lie four and seven metres below grade, "0" level being even with the Avenida Diagonal. The portion of the roof that does not double as a pedestrian square is designed in a saw-tooth pattern and is made of zinc. A large part of the building's facilities lie under this roof.

SITE TEAM

Department head: Jorge Marí Escanellas.

Construction manager: Cesare Ferrari.

Facility technician: Jaume Fradera Arimón.

Quality technician: Alex Albert Cabrera.

Office staff: Francesc Freixes Sanjuán.

Foreman: José María Valle Romero.

Esperanza Aguirre presides over the ceremony to lay the first stone on the new M-404 dual carriageway in Madrid

Esperanza Aguirre attend the ceremony.

On the 10 September last the president of the Community of Madrid, Esperanza Aguirre, attended the ceremony to lay the first stone on the new M-404 dual carriageway between the municipal limits of Serranillos del Valle and Ciempozuelos in Madrid.

The job consists in building a four-lane road 27.3 kilometres long, beginning in Griñón (where the new M-404 connects with the recently built M-407) and ending in Ciempozuelos (where it connects with the M-307).

The new dual carriageway runs parallel to the old M-404's layout. None of the old sections are being re-used, but there are a number of junctions between the old and new roads to maintain the service. The new road crosses the A-42 dual carriageway between Madrid and Toledo, the AVE line between Madrid and Seville, radial road R-4, the A-4 dual carriageway between Madrid and Córdoba and the Madrid-Aranjuez railway line.

A total of nine intersections will be built to provide service to roads M-407, M-417, M-419, M-423 and M-307, plus dual carriageways A-42 and A-4 and the towns of Torrejón de Velasco and Ciempozuelos. Plans call for 36 structures to deal with the crossings.

Esperanza Aguirre greets the workers.

BASIC INFORMATION

Job name: New M-404 dual carriageway. Serranillos del Valle-Ciempozuelos.

Developer: Autonomous Community of Madrid. Transport and Infrastructure Department. Directorate-General of Roads. Concessions Area.

Client: Sociedad Concesionaria Madrid 404.

Budget: 134 million euro.

Completion period: 18 months.

SITE TEAM

Group head: Ángel Serrano Manchado.

Construction manager: Alfredo Díaz Cobo.

Technical office chief: Oscar Olivares Malo.

The Protos wine company's new building lies inside the municipal limits of Peñafiel, on a largely triangular plot of land 10,000 square metres in area and framed by three roads, inside the town's urban district, on the slopes of the landmark Peñafiel Castle.

The idea behind the project was to take the bulk of the constructed volume, the portion having to do with winemaking and wine aging, underground.

The roof is regarded rather as the building's fifth façade. It was designed and built to feature five arch-like bays oriented toward the castle and shaped to fit the building's triangular shape. The material used to cover the building, large terra-cotta tiles, blend in with the terra-cotta roof tiles used locally.

This roof rests on the light envelope that encloses the building vertically at the access level. This envelope is a structure of parabolic arches of laminated wood that gives the roof vaults their shape. These vaults, which have a span of 18 metres, are enclosed by glass-and-aluminium curtain walls.

Both the roof and the light envelope rest on a sturdy base anchored in the ground. The interior face of the base's perimeter walls is surfaced in concrete, while the outer face is surfaced in stone.

The building is developed in four well-differentiated levels:

Entrance level
Featuring the vast lobby and the grape-receiving area.

Winemaking level
Where the stainless steel winemaking tanks stand, along with the shipping area, the bottling area, the bottling warehouse, the facilities rooms and loading dock.

Cellar mezzanine level
Where the auditorium, multi-purpose room, kitchen, wine-tasting room, tasting-wine storage room, restrooms and courtyard are located.

Cellar level
Area for storing barrels, bottle racks, barrel-washing facilities, archives, historical storeroom, machinery storeroom and staff locker rooms.

The building observes sustainability and energy-saving criteria that minimise the impact of solar radiation, through the use of ventilated terra-cotta sheathing on the roof and a nine-metre roof overhang on the south-facing elevation. In addition, water from the subsoil is used as an integral part of the cooling systems in order to reduce energy consumption.

BASIC INFORMATION

Job name: New Protos Wine Cellars in Peñafiel, Valladolid.

Developer/Owner: Protos Bodegas Ribera Duero de Peñafiel, S.L.

Project architect: Richard Rogers, S.L. + Alonso Balaguer y Arquitectos Asociados.

Completion period: 3 years, 5 months.

SITE TEAM

Department manager: Javier Courel.

Construction manager: Eduardo Bugallo.

Foremen: Carlos Alvarez/Javier Castro.

Production chief: Ana Sancho.

Facilities technician: Iñigo Gallego.

Administrative head: Carmen Ollero.

Draughtsman: Antonio Carmona.

CSR

FCC joins the Dow Jones Sustainability Index

Comparative among the Dow Jones Sustainability Index and the Morgan Stanley Capital Index.

FCC has been selected for the first time from amongst the world's leading companies in sustainability to join the group of 47 firms that make up the Dow Jones Sustainability Index.

Created in 1999, the Dow Jones Sustainability Index is a stock market index whose objective is to classify the companies that have got the best sustainability profiles. This index reviews the management of 2,500 selected firms each year and grades them on more than 50 criteria, some general and some specific for the sector the companies do business in.

Some of the actual criteria used are corporate governance, risk management, codes of conduct and anti-corruption codes, environmental criteria, human capital development, talent retention and attraction, philanthropy and social reports.

FCC's score can be attributed to things it did years back, when the FCC Group placed its faith in sustainability and a socially responsible commitment in its activities, which include services, cement, real estate and power, in addition to construction.

Moving in this direction, FCC's new strategic plan (Plan 10) has incorporated the sustainability and social responsibility of its business activities as one of the plan's central pillars.

The group's policy in this field is guided by the CSR Master Plan, whose strategic lines are good governance, steps to combat climate change, talent scouting and retention, brand image, higher safety levels, ecoefficiency, and dialogue and cooperation.

To boost and coordinate all these actions, four years ago FCC created a CSR Management Office, as well as a Group-level committee. FCC and all its business areas moreover regularly publish corporate social responsibility reports.

News

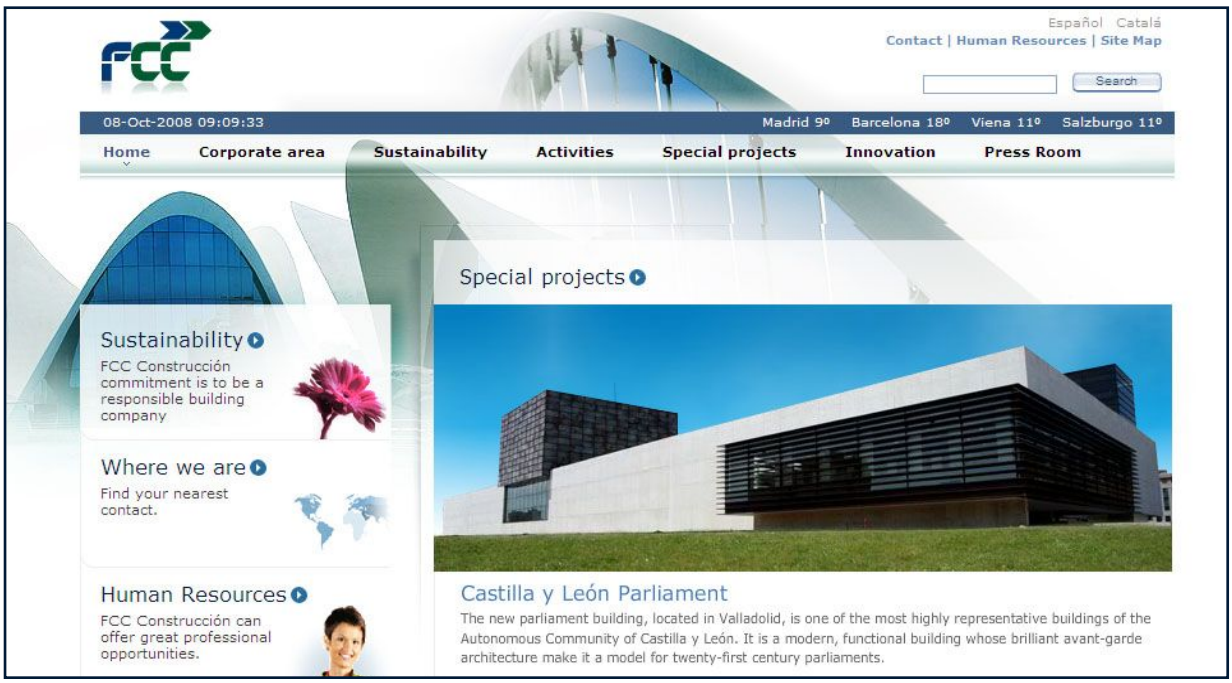
FCC attends EUROENGEO 2008

On the 15 September last, the Second European Conference of the International Association for Engineering Geology, EUROENGEO 2008, was opened at the University College of Technical Engineering for Public Works in Madrid.

The conference was a place where technicians and specialists in the field of geology as applied to engineering could meet and share their ideas and knowledge, and this year the focal point of activities was “Cities and Their Underground Environment”.

FCC attended EUROENGEO 2008 together with other companies from the sector and ran a stand that was integrated into the conference itself.

FCC Construcción launches its new Web site



FCC Construcción has redesigned its Web site, www.fccco.es, as a reference among Web sites in the building sector with regard to transparency and content.

The project, carried out by Telefónica Soluciones, offers a double AA accessibility level to the disabled, as per the WAI standards, independently of the browser and platform used. To reach this standard, important technical improvements were made. As in the past, the site is available in three languages, Spanish, English and Catalan, with the intention of making it an open communications channel for all groups of interest.

The main innovations at the content level include, for the first time, the publication of technical reports and videos of the most important projects carried out by the company's technical services. Until now, these had been for restricted publication and form a reference for the best building techniques in the sector. Two new sections have also been created, one dedicated exclusively to sustainability and the other to latest news.

The sustainability section responds to the company's commitment to sustainable development, arising from the top management of the FCC group. The Press room has been created to handle the real-time information needs of all those interested with the best available resources. The monthly electronic bulletin, with a link on the home page, is an irreplaceable complement for this information.

FCC Construcción, part of the FCC group, has over 100 years' experience in building activities and associated sectors and provides more than 50% of the group's turnover. In 2007, it reached a turnover of €6,957 million with a growth over the previous financial year of 58.3% and it employs over 26,000 persons. Of all of all its activity, 41.2% comes from abroad, especially from the central and eastern European countries such as Germany, Austria and Switzerland.

The Minister for Development attends the breakthrough of the La Cabrera (Valencia) tunnel

At 7,250 m, this is the longest tunnel on the Madrid-Castile La Mancha-Valencian Region- Murcia Region high speed railway line.

The Minister for Development, Magdalena Álvarez, attended the breakthrough or end of the boring of the second of the tubes in the La Cabrera runnel on 25 September. The tunnel is located in the Siete Aguas-Buñol section of the future Madrid-Castile La Mancha-Valencian Region- Murcia Region high speed railway line and was built by CC Construcción and Sando in a temporary joint venture for ADIF.

The 7,250 m La Cabrera tunnel is the longest on the 914 km that make up this high speed line. It is located in the Sierra de la Cabrera in the section between the municipalities of Siete Aguas and Buñol in the province of Valencia.

The channel consists of two circular tubes 8.75 m inside diameter excavated in carbonate rock (limestone, Dolomites, limestone marls, etc). The boring of the left tunnel ended last April, after which it was necessary to disassemble the tunnel boring machine and install it In the second tube to start excavation, on 6 May this year.

About Innovation

Article by R. Llamas, Port and Harbour Construction Manager

All too often, when we hear somebody talk about R+D+i, what pops into our mind is a picture of a group of people in white lab coats, sitting in a thinking posture and surrounded by different laboratory instruments until, after some time, a light bulb suddenly appears over a white-coat's head, and the thinker leaps up, exclaiming the historical, well-known word, "Eureka!" (The conclusion one might gather is that the company's think tank has just come up with some invention that is going to mean great benefits for society.)

This caricature is the real picture of an activity that has been so fundamental since the origin of the human species that even today a large part of today's society carries that mental picture around. The reality is that lately a certain amount of general confusion has been created with respect to the concept of research, development and innovation.

But what exactly is innovation?

Broadly speaking, I would say that innovation is the set of actions carried out by any human collective (or by an individual person as well) that seeks the objective of honing the efficiency of one's own system of operation and the usefulness of the products one deals with in one's essential activity, within a previously defined strategy.

Brief analysis of the definition above leads to the following comments:

1) A firm's actions can be implemented through specific departments created for that purpose or else through joint work with outside companies whose mission is to generate fresh ideas to improve their clients' products and make them more competitive. What is more, involvement in such activities by the clients and suppliers that regularly play a part in a firm's different processes would be an enriching experience. It would not only significantly broaden the flow of ideas and resources, but it would also strengthen client and supplier fidelity, which is a important aspect in boosting competitiveness.

2) It is essential for these actions to be fully imbricated within the general strategy that the firm has previously mapped out. Otherwise the firm would be making a big mistake, wasting vast amounts of resources in terms of money and time, in a process that will bring in no value for the company. In this sense we can speak of "innovation strategy" as a fundamental component of the company's general corporate strategy.

3) The objective of achieving a real increase in product usefulness means there are two kinds of innovation. There is innovation that tries to achieve successive improvements through minor changes inside a family of previously established solutions. That might be termed "ongoing improvement innovation". And there is innovation based on drastic changes, by means of seeking and introducing families of solutions that are totally different from all previously established solutions, or "conceptual innovation".

But innovating depends on other factors, too: the different production processes involved, the systems used to measure the increases in value that have supposedly been achieved, and, of course, incentives as well. The type of innovation attained in any human collective depends heavily on the proportions in which these factors are combined.

Let us now enter the practical realm, and more particularly the sector of construction in ports and harbours. The great transformations that have taken place in the sector lately and the extraordinary competitiveness between rival firms plus the minor differences in the work finished by one company or another (The products in question are differentiated in very little) are demanding and justifying greater efforts aimed toward winning a larger market share, amongst other objectives set at our firm. One way to pursue this objective is to think up and implement technological innovation projects.

In 2004 and 2005 our firm developed a project entitled "Low-reflection Caisson Solutions in Docks and Seawalls".

Essentially, the genesis of the process is based as follows: When wave energy hits a marine structure, part of that energy is transmitted to the structure itself, part of the energy dissipates due to turbulence or viscous friction, and the rest is reflected.

Obviously, it would be advantageous if the least possible amount of energy is transmitted to the structure, and furthermore it would be advisable to keep energy reflection low. For these two reasons it was seen as an interesting objective to work out a design that was open enough to be used in the largest possible number of different sea situations and provided maximum incident energy dissipation, thus minimising reflection, which is the main cause of agitation inside harbour basins.

Based on this very simplistic approach, in view of the scarce background knowledge available about the subject, and in anticipation of numerous practical applications in the field of anti-reflecting dock and seawall design and construction that could give our company an added-value advantage over our immediate rivals, the decision was taken to make the R+D+i investment the project would require.

Work was structured into two phases. In the first phase the best configurations for anti-reflecting docks and seawalls were determined, and the state of the art was reviewed. In the second phase the best-behaving configurations selected from the previous stage were analysed in detail, and furthermore the points involved in any practical execution application were studied, such as strength, naval stability, structural stability and the construction process.

The studies' conclusions yielded a design for an anti-reflecting caisson that displays excellent behaviour when faced with a wide range of sea situations, in both docks and seawalls. Later, in July 2007, FCC Construcción, was granted ownership of the patent for this invention by the Spanish Patent and Trademark Bureau.

The construction of anti-reflecting marine structures entails a series of obvious advantages, including these:

- Reduction of the agitation inside basins, which helps improve performance in harbour loading and unloading operations, especially now that the conditions for the transit of certain kinds of goods at specialised terminals are becoming increasingly demanding.

- Important reduction of the energy and the amount of water transmitted when waves wash over seawalls, avoiding possible damage to facilities sited on the extrados side of the seawall, thus opening a new door for the design and use of harbour spaces.

- Considerable improvement in ship manoeuvrability in access channels and other navigation areas.

- Increase in the level of comfort inside marina basins, since agitation is minimised.

- Increase in the level of shipping safety for fishing boats and recreational craft on stormy days in areas relatively close to vertical seawalls.

ALPINE uses a helicopter to assemble a bridge in Gaweinstal, Austria

Sixty 27-metre-long, two-metre-high parts took three hours to carry instead of the three weeks anticipated in the contract.

In the work on the A5 being done by Bonaventura Straßenerrichtungs-Gmb (in which ALPINE holds a 44% interest), a special heavy-cargo helicopter was used to fly in 60 27-metre-long, two-metre-high parts belonging to the structure of a bridge in project Y in Gaweinstal, Austria. The operation took three hours, as opposed to the three weeks it would have taken to bring the parts in by road.

First of all, the structure was assembled at the south bridge, in Graben Pellendorf. Once it had been completed, it was broken down into parts and carried by helicopter to the north viaduct in the Weidenbach region. The parts, attached to the helicopter by an 80-metre-long cable, were flown from one valley to the other. On reaching their destination, the north viaduct, they were set down between waiting pillars, where they were reassembled.

Project Y includes the A5 from Eibesbrunn to Schrick, the west S1 from Eibesbrunn toward Korneuburg, the east S1 from Süßenbrunn toward Eibesbrunn, and the S2 bypass around Süßenbrunn, and it forms part of the Austrian ring road.

ALPINE finishes work on Lainberg Tunnel in Austria

ALPINE Bau GmbH has finished construction work on Lainberg Tunnel, where dual carriageway A9 passes through Pyhrn. From now on motorists can drive through two one-way tunnels.

In addition ALPINE has made improvements to the pre-existing tube, which ALPINE itself built in the nineties. The work was done for ASFINAG, and the project's cost came to 22.5 million euro.

Technological challenge

Despite the characteristics of the rocky stratum and the condition that work could never be allowed to stop railway traffic, ALPINE managed to bore up to 24 metres of tunnel a day, an extraordinary rate of progress that enabled the second tube of the tunnel and all improvement work on the first tube to be finished by the scheduled date.

The work done on the second tube (east tube) of Lainberg Tunnel is split into two sections, the 2,215-metre-long main tunnel and a shorter (187-metre) tunnel situated to the north.

The conventional boring system was used, with the added difficulty of a crossing under a section of the Austrian railway tracks, about 2.5 metres long and at a very shallow depth, without stopping the trains. The project encompassed the construction of the operating buildings and the architectural work at the tunnel mouths.

During the improvement work, which took six months, the pre-existing west tube underwent conversion from two-way to one-way traffic, and safety systems equivalent to the ones in the east tube were installed. Between February and August ALPINE built seven cross-tunnels and repaved the tunnel mouths. The drainage facilities have also been replaced, and tunnel relining work has begun.

Seven tunnels by ALPINE on the Pyhrn dual carriageway

ALPINE has built a total of seven tunnels on Pyhrn's A9 dual carriageway and is therefore responsible for a very important portion of the tunnels between Kirchdorf and Windischgarsten. Some of its leading work there includes the Lainberg Tunnel, the exploration level for the Klaus Tunnel Chain, comprehensive alterations to Kienberg Tunnel and the original Krems Tunnel and partial alterations to the Falkenstein, Spering and Traunfried tunnels.

ALPINE's tunnel-building experience

The tunnels ALPINE has completed so far include Pfänder Tunnel, Tradenberg Tunnel and Katschberg Tunnel in Austria, and since 2001 ALPINE has been participating in the construction of the St. Gotthard Base Tunnel in Switzerland.

ALPINE is also involved in tunnel work in India, where it is participating in several sections of the new New Delhi underground system and a headrace tunnel at the Tapovan hydroelectric power plant. In Singapore it is working on the underground system; in China, it is slated to build a water supply tunnel; and it is going to build the tunnels for a power plant in Bulgaria and a power plant in Turkey.