PARKING LOT OF FUENGIROLA (MÁLAGA)

On January 13th, 2005, Parquigran S.L. signs an agreement with the city council of Fuengirola (Málaga) for the construction and subsequent exploitation of an underground parking to be located at the subsoil of *Plaza Andrés Yebra* and *Paseo Marítimo Rey de España,* between the street *Lamo de Espinosa* and *the Port.* This project was carried out together with the construction company *Azvi S.A.* joined in a Temporary Consortium. The aim is to build 828 parking spaces distributed in 4 underground floors.

This parking lot is located at a very privileged area of Fuengirola where there are no enough parking spaces. The concession for this parking has been established for 50 years.

As happens with the parking lot of *Puerta del Mar*, the construction of this parking is a great constructive challenge for the Company since it has been used a pioneer method in Spain. The project has been carried out a few meters from the beach and the excavation has reached 15 meters depth. The parking is constructed over a surface area of 29,400 m2 and it is divided in four underground floors. Thanks for this kind of construction it has become a leading facility in Spain.

For the construction of the parking the structure is carried out in a descending system in mine type or, in other words, built from top to bottom. The aim of this structure is to control water from the Atlantic Ocean since the water table was one meter from height 0.00.

The perimeter slurry walls of 100 cm thick reach 30 meters depth in order to build them into the rocky subsoil and in this way give the vessel configuration. For this, it has been applied thixotropic sludge using bentonite.

After this process, we proceed to the pile driving, with the double objective of executing the anchorage system for the future underpressure-foundation slab and serving the pillars to the frameworks. These are done in “in situ” vertical borehole, at 30 meters depth with 1500 mm in diameter and an internal metallic support HEB 300.

Once the pile driving is finished, it is time for excavation until height -9.00 to construct floors 0 and -1 from which the draining of land beneath them continues.

To evacuate water from the sea, it was necessary to dig a pit with height below -16.5, assembling a steel cylinder of 1000 mm in diameter, which serves to accommodate 10 drainage pumps. These pumps are connected to pipe systems. The pumping system may allow water drainage of 500 liters/second.

Finally, the foundation slab, which supports an underpressure pressure of 13Tm/m2, is implemented with 1.4 meters thick, without concrete joints and with a waterproofing system. When this system acts by osmosis it avoids micro cracks, proceeding thereafter to a draining chamber of 13 cm and to a trowelled concrete finish.

Then, the surface of each floor is painted with paint made on polyurethane and quartz base that facilitates the adherence of vehicles and cleaning.

PARKING ESTIMATED FIGURES:

- **Earthworks** **100000 m3**
- **Drainage** **500 Hm3 – 500 l/s**
- **Concrete used** **35000 m3**
- **Iron used** **4000 Tm**
- **Workforce** **200**
- **Project deadline** **18 months**

To carry out the works, Parquigran had the collaboration of the best professionals, specialists and companies with wide experience in foundations, pile driving, waterproofing and so on as well as with the latest technology in the field.

This parking lot will put an end to parking problems in the area due to the great number of vehicles nearby the beach.