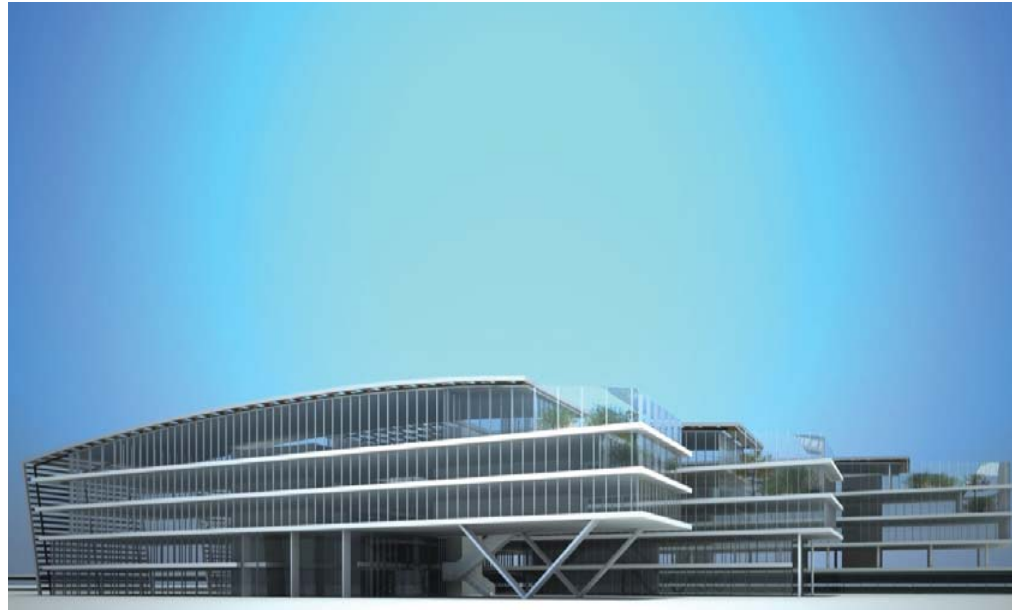


IBERIA New Headquarters

Barajas, Madrid.

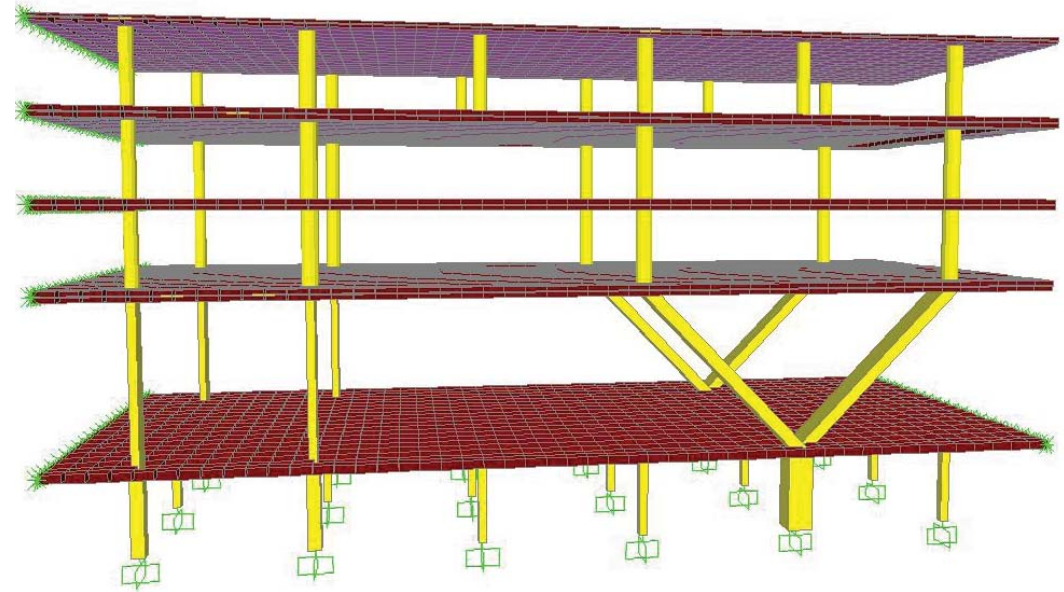


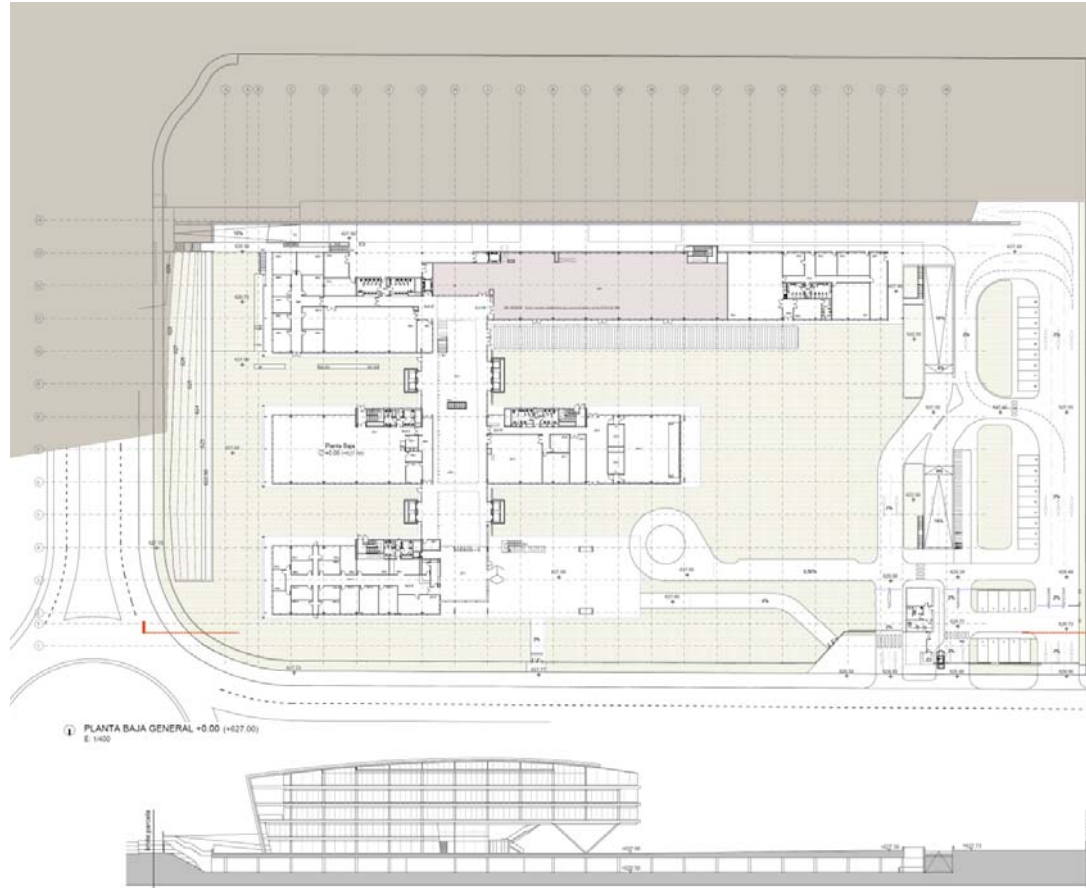
CLIENT	Rafael Ortiz Arquitectos
DATE	2012
LOCATION	Madrid- Spain
FIELD OF ACTION	Structural and Foundation Construction Project

Above ground, five main modules are distinguished; three on the east side and two on the west side consisting of five floors. The first four are dedicated to offices and the last to facilities.

IBERIA New Headquarters Project in Madrid consists of a single building composed of several office modules that are connected by an atrium. The building is formed by one basement, a ground floor, four floors above ground and a roof. It is placed on a plot located in proximity to the T4 Barajas Airport Terminal.

The underground floors occupy the entire plot footprint and consist of a basement dedicated mainly to car parks and facilities areas, and a ground floor dedicated to offices and gardens.





The building's location, near the Barajas T-4 Terminal, implies that the total height of cannot exceed the maximum allowed by civil aviation, thus the structural system must be such that allows the choice of the minimum floor thickness as possible. The building is covered by a steel roof formed out of aluminum slats with skylights. The structure's geometry is

defined by the functionality and the architectonic idea.

The columns grid is 7.80 x 7.80 m underground, and 7.80 x 15.60 m above ground level, so that transversally one out of two columns die in ground floor. In some zones, cantilevers smaller than 3.00 m have been defined.

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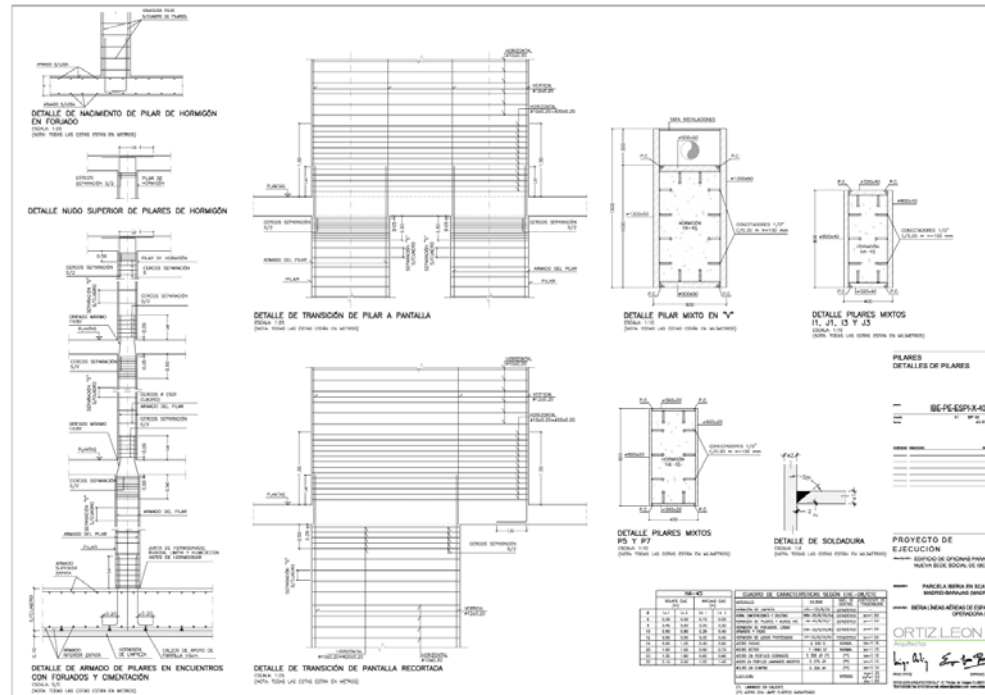
Barajas, Madrid.

The structure is seen on facades and some interior zones, so their appearance has been taken into account in the choice of slender solutions.

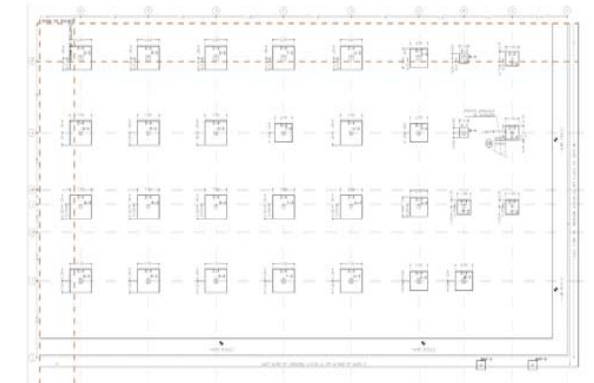
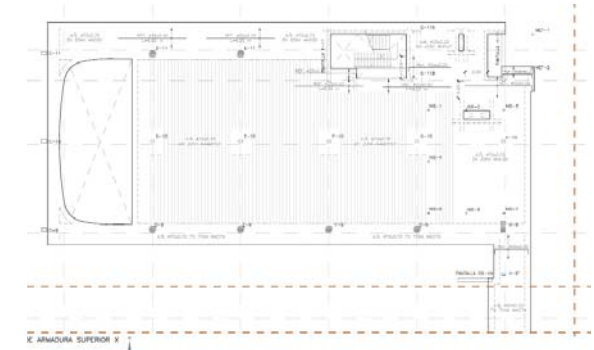
It is important to point out that during the phase of the basic project, the architecture / structure interaction was studied in detail, therefore the final architectural conception has taken into account the structural system. During the structural conception phase different structural systems were studied (precast solutions, reinforced concrete solutions, prestressed concrete solutions and steel solutions), concluding that the optimal structural system is the one described below.

The ground floor, with a column grid of 7.80 x 7.80 m, is formed of a concrete slab 0.40 m thick. The choice of this structural system has taken into account both the big loads that it must support (common areas and urbanization), and the criteria of maximum slenderness, minimizing the basement excavation.

As indicated above, the building is composed of 4 floors above ground level with similar geometries, whose principal layout is of fingers connected by a central corridor. These floors are supported on a 7.80 x 15.60 m column grid, resulting in single 15.60 m spans with no intermediate supports.



IBERIA New Headquarters Barajas, Madrid.



The choice of using hollow core 0.50 m thick prestressed concrete slabs focuses on minimizing thicknesses and maximizing structural slenderness. It should also be noted that this structural design gives an elegant solution to the exposed cantilevers seen from the outside on facades.

The vertical structure is formed by columns and shear walls. Their design is aimed to, on the one hand

be the main part of the supporting structural system, and on the other, supply the overall structure with enough rigidity against horizontal forces, wind predominantly. All these vertical members have been designed in reinforced concrete.

Singularly, in order to provide the building's entrance area with a big open space, the vertical structure is changed for two V-shaped columns.

Finally, the foundation of columns and shear walls is solved by direct foundation with either single or wall footings calculated for a bearing capacity of up to 0,4 kp/cm². A system of conventional retaining walls has been designed to support the surrounding earth, taking in mind that there are no other buildings nearby and there is only one underground floor.