



# PEIKKO'S STRUCTURAL CONNECTIONS

## USED IN BUILDING NEW IKEA STORE IN SPAIN

Peikko Spain has worked with precast company Tecnyconta in the construction of a new store for the Swedish furniture giant IKEA in Valladolid, Spain. All the prefabricated columns in the project were connected to each other by using Peikko's products. Peikko was chosen as the provider of steel components for two reasons: first, because of the significant savings its products generate, and second, because its building systems are adaptable to any type of structure which on its part provides security, speed and cleanliness at the building site.

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**T**he new IKEA store, which is part of a shopping mall called Río Shopping, is located in the vicinity of Valladolid, a city some 200 kilometers northwest of Madrid, Spain. The complex is built in "U" form. Its two floors will have a total size of 100,000 square meters. The IKEA store will be located in the central area of the "U" and cover 34,700 square meters. The store will be integrated into a large atrium with an innovative design that will lead to the rest of the shopping mall. The size of the mall is 41,000 square meters. It has premises to accommodate

more than 100 stores. The shopping complex will also have a 25,000 square meters parking space with capacity for 4,900 vehicles.

The whole investment, part of the expansion of the Swedish multinational IKEA in Spain, totals more than EUR 200 million and will create more than 1,600 jobs directly and 350 indirectly. According to IKEA's estimates, the new commercial facilities will be visited each year about 10 million customers from northwestern Spain. IKEA plans to

invest EUR 2 billion in Spain over the next six years, which will create 20,000 new jobs. The Swedish furniture giant will open two stores on the average a year in Spain until 2015, and thus double its network on the Spanish market.

### INNOVATIVE PROJECT

As the building project was likely very complex it was necessary coordinate between all the companies involved, including Peikko. The foundation of the shopping mall, which has been made by the company Grupo Rodio Kronsa, is a deep foundation which was done by the driving of precast concrete piles.

The IKEA store space is surrounded by a perimeter precast concrete wall. The dimensions of the building are 185x125m, and the whole structure (beams, columns, floors, roof, cladding, etc.) is prefabricated. A special feature of the project is that the building has no expansion joints. In addition, all the main units of the building and the staircases are also prefabricated, which is an innovation for an IKEA store in Spain. The complexity of the structure is remarkable. Secondary beams had to be supported from main beams to







"Peikko products ensure a combination of high quality, technology, efficiency and sustainability of resources in production."

get more width and avoid columns in the commercial space.

In total, there are 254 precast concrete columns in various cross sections. The most common sections are 50x50cm and 40x40cm, up to 80x30cm and 100x50cm cross sections. Most of the connections of the columns to the foundation were made using the standard column shoes types HPKM 20, HPKM 24, HPKM 30 and HPKM 39 with their respective short anchor bolts type HPM/L.

### STANDARDIZED AND TAILORED SOLUTIONS

The adaptability of the Peikko connections has been a key factor to meet the requirements of the project. The Technical Department of Peikko Spain



has done an important work of calculation and design of the connections of the project to find the best solution for each case.

Most of the connections could be made by Peikko's standardized solutions. The project has been completed by special, tailored connection solutions due to very high loads and tight cross sections of the columns. In these cases it was necessary to use the column shoes for heavy loads type PPKM 45 and PEC 52, and the anchor bolts type PPM 45/L and PPM 52/L.

In the project, a total of 2,000 units of different types of Peikko column shoes with their anchor bolts were used. The time of delivery of all Peikko products has been very fast, a fact that has been crucial to fulfill the deadlines for casting the foundations and precast columns.



Security as well as fast and easy assembly of the columns has been of utmost importance in the project due to strict deadlines and the large size of the building. These advantages have been very important because there were several assembly teams at the same time on site, and it was needed to place the cranes in areas of difficult access. Moreover, the trucks needed to off-load the deliveries of the precast elements as close as they could from the assembly area, which they had to access through narrow passages. The customer needed a system which ensures reliability, security and fast assembly of the structure, so that next finishing processes of the building could begin as soon as possible. Undoubtedly, if they had used a traditional system, the rate of assembly would have not been as good as that achieved when using the Peikko system. ■

## HIGH PERFORMANCE AND SAFETY

IKEA's Valladolid store is a quite special project compared to others made of precast concrete structure. In many parts of the structure, loads of the columns were placed quite high in the erection phase, making the column foundation connection rather exceptional. In this sense, Peikko's connections have performed much better than other solutions available in the market, such as conservative socket

foundation or sleeves, where one would have to wait for the mortar to harden. With Peikko's solution, no additional bracing is needed during the erection phase. Erecting the precast elements was also fast and easy and allowed us to save time.

Peikko's solution also increases work safety. It reduces the risk of accidents where columns fall when bracing fails, which

happens when using traditional systems like sleeves. We trust Peikko's bolt connections because of their reliability and simplicity.



Luis Forcano  
Technical Director of  
Tecnyconta



## THE MAIN ADVANTAGES OF USING PEIKKO PRODUCTS TO SOLVE THE COLUMN CONNECTIONS IN IKEA VALLADOLID

Peikko column connection is an advanced and technological system that ensures maximum safety on site and the optimization of resources and deadlines. Installation of the structure requires less manpower and it carries lower labor risks due to their specialization and experience. This fact increases safety in the building site and reduces accidents. Another important point to make is that the amount of waste generated is lower because the Peikko system is more efficient and sustainable than other traditional systems.

- Positioning of bolts into the pile cap is made easy thanks to the use of the installation frames recommended by Peikko.
- Interference between Peikko Anchor Bolts and reinforcement of the foundation, which is often very heavy as in this case, is minimum compared to other traditional connection systems for precast columns.
- The thickness of the foundation is less than using other traditional systems. Thanks to this advantage important savings in materials (concrete, reinforcement, formwork, etc.) and time (fewer hours of excavation, concreting, auxiliary works, etc.) when making the foundation of the building. The bigger the building project is the more important are the cost savings described.
- Faster assembly system of precast structures involves shorter periods of assembly and cost savings in specialized workers and cranes, compared to traditional building systems.
- Safer system during and after installation of the columns compared to traditional systems. This greater safety is very important in large scale projects where there are many jobs and movements at the same time in the building site.
- The connection of the columns using the Peikko system is rigid immediately after tightening the nuts, so it is not needed to brace the structure during the assembly of the columns or during the process of grout mortar sets. No braces are needed and free access on the site is guaranteed.
- The system allows quick installation of the column and easy leveling of several centimeters (-2 cm, +3 cm depending on Anchor Bolt types used).
- Total adaptability to all types of weather conditions.
- The precise installation of Peikko Anchor Bolts makes it much easier for the rest of the structure to fit perfectly. This is very helpful in complex structures.