



# Cristalia Office Buildings 5 & 6

Madrid, Spain / 2002-2005

Structural type  
Owner  
Client  
Constructor  
Scope  
Architect

poststressed grid slab  
Bouygues Inmobiliaria  
ISO - FCC  
ISO - FCC  
detailed design and construction monitoring  
Estudio Lamela & Hok



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These two buildings are composed of 7 rectangular levels above grade of 71.33 m (East-West) x 18.40 m (North-South). There are three common levels for both buildings: ground floor, basement -1 and basement -2. The dimensions of the rectangular levels of the basements are of about 95 x 70m.

The reasons for the choice of these three waffle slab typologies are as follows: in the case of the general floor typology, due to the large 17.10m spans between columns, in the case of the ground floor and basement -1, the difference is the result of the heavy existing loads on the ground floor due to level differences between the upper level of the waffle slab and the level of the finished floor which are solved employing screeds and fills which is also the case in the area destined to fire brigade access.

The access ramps to the basement floors are composed of concrete slabs with a constant, equal 0.30m depth.

The vertical structure has been resolved employing columns and walls situated in the lift shafts, given that the latter are perfectly situated to fulfill this function. The vertical loads are transferred through the columns and the horizontal, via the aforementioned cores or shafts and the walls.

The columns which support the floors above grade are situated on the perimeter of the building for architectonic reasons. They have spans of 17.10m in the North-South direction and 8.10m East-West. The columns are rectangular 0.90 x 0.50m in shape with the shorter side running parallel to the façade. The columns are set back in basements -1 and -2 ending up with spans of 13.20m and 8.10m in each of the directions. The columns on these floors are also rectangular in shape with dimensions of 1.50 x 0.60m.

To solve the setting back of these columns between ground and first floor, it is necessary to employ battered conically -shaped columns with rounded-off edges.

In general, most of the supports are of reinforced concrete except in two cases: the first is the supporting pier to the staircase located near the cores, where steel profiles HEB-160 have been employed to assure a reduced cross section which is compatible with the façade, and secondly, the columns which support the slab which closes off the lift shaft, where steel profiles HEB-140 have been employed.

It has not been deemed necessary to employ structural joints in the floors of the building, given that the dimensions are sufficiently moderate to fear structural effects in slabs or columns due to thermal or rheological effects.



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