

## Vallehermoso Company Headquarters

This building, originally designed for the future headquarters of the Vallehermoso Company and located in Madrid on Eucalipto Street, a side street off the M-30 ring road motorway, was built by Dragados, S.A. The architectural design was developed by Juan Ligués Estudio de Arquitectura.

The building consists of seven floors above ground level and four basements storeys below the M-30 ring road. The building is approximately 65m long and 20m wide. From a structural point of view, the building possesses some outstanding characteristics: a load centering beam of large dimensions on the ground floor, an 11m span in the centre of the building with the beam being only 38cm in depth and a total absence of joints. Although the building itself is rather unpretentious, its structure follows the general philosophy, supported by FHECOR, of avoiding joints in building design. This implies that the problem of imposed deformations in calculation has to be dealt with, leading, however, to significant improvement in functionality and durability at minimum cost.

The load centering beam is the most outstanding structural element in this building upon which the seven above-ground-level storeys rest.

The reason for the election of this beam lies in the architectonically imposed change of the column layout upon reaching the ground floor. Nonetheless, this beam presents an additional problem: as the column that carries this beam could not absorb its bending moments in case of embedding the beam in it, it would be necessary to introduce a hinge at the bottom of the beam. The hinge that was finally considered most appropriate was of the concrete Freyssinet-type. This very common solution in the early history of reinforced concrete and rather unjustly forgotten nowadays, consists of narrowing the concrete cross section in such a way that the concrete of the hinge may yield ( $2 f_{ck} < c < 3 f_{ck}$ ). Subsequently, the concrete permits rotation without collapsing, as long as some given geometrical dimensions are respected (reduced slenderness).

This solution which had already been employed by FHECOR Consulting Engineers for the design of the bridges in stretch I of the M-40 ring road motorway in Madrid and also for the bridge over El Burguillo Reservoir was chosen for its great advantages: economy, simplicity and well-functioning.



### Spain /2002 Project data

Structural type:  
Solid and waffle slabs  
Location:  
M-30 ring road, Madrid  
Opening date:  
2002  
Architect:  
Juan Ligués  
Construction:  
Dragados, S.A.  
Proprietor:  
Testa Estate Agents  
Scope of Works:  
Construction Project and  
Technical Assistance