CAMPUS REPSOL. CONSTRUCTION OF STRUCTURE

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Summary

This communication describes the construction process of a really complex structure, with multiple linkages between elements of very distinct individuality (both structural and architectural), which have an inherent and strong interrelationship; particularly between the structure and the facade (the first is part of the last). This defines structural forms taken to the extreme, which cause difficulties and a huge work to take the step from the projected to the construction structure.

Keywords: Post-tensioning, structural steel frames, stiffness combination, galvanized, thermal strains, shrinkage and creep, topographic survey, composite bridge beam suspension, suspended slabs, facade-structure interaction.

1. Building Overview

The project, by Rafael de la Hoz architects office with NB35 as structure engineering, develops four buildings as offices for REPSOL Company in Madrid. The whole building consists of a volume of five above grade level floors around a courtyard and two below grade floors occupying the entire plot (Figure 1). The below grade floors have an area of about 25,000 sqm each, above grade levels are built with total of 50.172m ²

Figure 1. Views of the project

1.1 Structure

The building has a vertical structure made by, below grade levels, five main families of reinforced concrete columns, which support each of the five bodies the building is divided in. These main families are spaced 8.10m in the longitudinal direction of the buildings, and 16.20m in the transverse direction, shaping the larger span for primary bending. Above grade level, columns are steel plate box-formed sections, of high slenderness in the direction perpendicular to the main facade. Also, there are four communication cores (one per body) which are reinforced concrete cores from foundation to roof level.

The predominant horizontal structure is made by post-tensioned slabs, 0.50m thick on columns strip, covering the main 16.20m bending span, and are lightened up to 0.20m in the central strip,

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