

“Iron cages”. Technical discussions after the 1906 Valparaíso earthquake and reconstruction with new techniques and materials.

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ABSTRACT

A few months after the San Francisco earthquake and fire in April 1906, the prosperous and cosmopolitan city of Valparaíso (Chile) suffered a similar catastrophe, sparking the forerunner application of new materials and construction systems.

After the earthquake, reports, and articles were produced analysing the characteristics of the earthquake and its effects on the built environment, emulating at a more basic level those emanating from the ad hoc commissions created to analyse the earthquakes in San Francisco and Messina.

At the theoretical level, solutions for reconstruction were discussed between reinforced concrete and steel structures, and the applications of these new materials, structural systems, and constructions in the world were closely observed.

Discussions among specialists do not account for the heterogeneous flow of knowledge and freedoms given to architects, engineers, and builders in the absence of national building regulation and a weak local ordinance, even many years after the earthquake.

The solutions used for reconstruction ranged from proven inefficiencies prior to the earthquake to new techniques and materials. In this area, the use of steel with imported pre-manufactured systems as well as local solutions stands out. The need to reconstruct public and private buildings in Valparaíso with a reliable and fast system leaned the choice at the beginning towards the use of pre-manufactured metal structures. In the analysis of the material choice, it should be taken into account that just in 1924 Chile had a local steel production, with a brief and failed attempt in 1910 in the Altos Hornos de Corral.

The article will expose and analyse the discussions of the time regarding construction systems and materials from a seismic-resistant point of view, complemented with the description of three emblematic cases of metal medium height construction in Valparaíso, after the earthquake: the Hucke Factory, Cardonal Market and the “Jabonería La Estrella” Factory.

In the studied buildings, which have a compact geometry, the filling of the walls is placed between the steel profiles, keeping them visible both externally and internally. The three analysed buildings correspond to the Steel Frame system, a metallic lattice with filling walls, whose first antecedent as a medium-height building with an iron structure is Jules Saulnier's Chocolaterie Menier built in 1872 near Paris. However, the structures analysed differ from the building of the chocolate factory in two significant aspects. In the cases studied, laminated steel predominates, as the construction material and the configuration of the bracing elements are reticulated beams and pillars, not a net as in the Menier factory.

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