Early concrete structures, post patents system: lessons to preserve XXth historical heritage

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ABSTRACT

Reinforced concrete came into Spain in the late XIXth century. The beginnings were based on patented systems. Early patents had foreign authorship but soon Spanish engineers, architects and industrials developed their own RC systems. Local dealers built structures with little justification for calculation, design and construction in the first decade of XXth century. Nevertheless, as further knowledge was required, the increasing research led to new RC standards in numerous countries, such as France and Germany. In the second decade of the XXth century, the patent systems declined. RC teaching began at the Spanish Civil Faculty and scientific calculation systems were adopted, although there were no Spanish RC standard, which is the reverse of the situation in most European countries. Hence, RC structures had a great growth, based mainly on French or German calculation standards.

Northern Spain, due to its industrial activity, was pioneering in the use of new material, and leadership continued during next decades. Nowadays, some of those buildings are listed as heritage. The article discusses some common features of 13 RC structures built between 1915 and 1929, focusing on conservation problems. Various technicians carried out preliminary structural studies, analyzing their morphology, steel and concrete strengths and pathological processes. The result of the study is analyzed connecting construction features with structural condition, understanding the main characteristics and simmilarities. This will increase the knowledge about structures constructed with post patented systems in a period poorly studied. It will also allow having a previous estimation of aspects that could be expected in future rehabilitations.