

From its origin in 1262 until nowadays the Cathedral of Valencia has been a lauded building, it is a compendium of different architectures which has a complex reading as a consequence of the several interventions it has suffered throughout its own history. The Dome stands out from the whole Cathedral's building. It is a construction admired not only for its compositional interest but also for the continuous structural working made over it.

Most of the Cathedral researches are mainly focused on an historical analysis apart from a few cases dealing with constructive matters. Structural field remains almost unknown and it is the main aim of the thesis. A structural and constructive analysis of the whole Cathedral has been performed and particularly of the Dome.

This analysis provides the needed knowledge to understand that the constructive-structural logic the Cathedral was built up with determines its own structure, which clearly differs from the European central gothic. This organises an architecture with a formal characteristics commonly used in the Mediterranean area causing what has been called as "A Mediterranean gothic architecture". It is a style distant from the traditional gothic characteristic canons. It is about an analysis based on the evaluation and checking of the specific wall system. A continuous diaphragmatic components system is hidden below its terraces standing behind a better behaviour of these structures while facing some possible earthquakes. Facing seismic actions shape is as a crucial factor in its structural behaviour.

In order to reach this demonstration a three-dimensional structural model of a Cathedral section as a representative volume has been made. This model allows us to understand the Cathedral structural behaviour facing shear stress and to obtain conclusions to clarify the structural doubts that have been set out and repeated by several authors without been demonstrated.

Scarce studies in relation with the Dome are focused on its structure analysis. As precise plans joining together all its geometry do not exist, a geometrical rising has been elaborated by means of the Laser Scanner technique. Using this technique allows to obtain not only a precise geometry but also a current state, reflecting collapses, slopes, etc.

The detailed 3D plans elaborated reveal its real geometry which is far away from a first visual impression. These results permit us to go deep into the study and to match the data obtained from other documented sources, all this information is the starting point of the study and interpretation elaborated about the Dome's constructive system.

Two analyses are lay out, the first one is based on the limit analysis calculation and from the obtained geometry the Dome's stability is evaluated. The second analysis allows through the whole Cathedral 3D model to analyse the possible Dome structural behaviour in front of a seism.

The most advanced calculation methods available at the moment have been used to perform these analyses.