

## ABSTRACT

The *Proyecto de la Cubierta del Nuevo Estadio del R.C.D. Espanyol* is presented as a Speciality Project, and is situated as a part of the *Proyecto del Nuevo Estadio del R.C.D. Espanyol*, that will be presented as Career Project. Therefore, this project is an essential complement for the whole New Stadium of R.C.D. Espanyol, situated in Cornellà de Llobregat.

The general content is structured like a typical project, but making special attention in design and análisis of the roof structure and presenting reduced budget and specifications document.

The report is divided in two differentiated parts:

1. The first one discuss of the whole stadium, defining generally its characteristics.
2. The second one enters fully in the roof of the stadium, of which study and definition are made exhaustively.

The first part is an introduction and a placing for the project of the roof structure. In this part is established a briefing guide of the whole stadium and are described briefly the geometrical and structural characteristics of the general project. In this description is clearly shown the división and the independence between the two main groups of the stadium: the internal structure, made of concrete; and the external structure, steel made, corresponding to the roof and the façade of the stadium.

This necessary introduction allows us to enter into the second and main part of this project. The main objective is to design the roof structure of the stadium, achieving geometric, structural, geotechnics, aesthetics and users comfort conditions.

These conditions make a complex projected structure, so to reach the planned objective, it has been necessary to make a repeating process of the conception of the final solution. This process is divided into three parts: the first one, a lineal analysis of the structure created, with an analysis computer program; the second one, a checkup of the structure, starting from the analysis data; and the third one, a decision take about the modifications to made in every case, starting from checkup results.

The process has been repeating always these three parts, but at the same time they have been suffering transformations. The modifications made in the initial part of the process consist of the general geometry of the structure. As the process has been progressing, these modifications turned into smaller and more concrete modifications, to sections level. The verification task has been the opposite trend, starting very particularly and finishing generally and completely.

Once arrived until the end of the process, the structure is described retail. The final result is a structure generated by a space mesh made of steel frames, with parabolyc geometries prevailing, with the intention of reach big spans (until 204 m) using the arch element, specially in trusses. Also are shown the outstanding results about forces and displacements of the elements of the structure.

The general design of the roof is guided to create a visual landmark, with some capacity to artact clients. Definitively, this project tries to be a feasible, coherent and structurally conceivable alternative of the project that is at the moment in approval fase.