

Nice Stadium: Design of a Flat Single Layer ETFE Roof

Authors : A. Escoffier, A. Albrecht, F. Consigny

Abstract : In order to host the Football Euro in 2016, many French cities have launched architectural competitions in recent years to improve the quality of their stadiums. The winning project in Nice was designed by Wilmotte architects together with Elioth structural engineers. It has a capacity of 35,000 seats. Its roof structure consists of a complex 3D shape timber and steel lattice and is covered by 25,000m² of ETFE, 10,500m² of PES-PVC fabric and 8,500m² of photovoltaic panels. This paper focuses on the ETFE part of the cover. The stadium is one of the first constructions to use flat single layer ETFE on such a big area. Due to its relatively recent appearance in France, ETFE structures are not yet covered by any regulations and the existing codes for fabric structures cannot be strictly applied. Rather, they are considered as cladding systems and therefore have to be approved by an "Appréciation Technique d'Expérimentation" (ATEX), during which experimental tests have to be performed. We explain the method that we developed to justify the ETFE, which eventually led to bi-axial tests to clarify the allowable stress in the film.

Keywords : biaxial test, creep, ETFE, single layer, stadium roof

Conference Title : ICSE 2014 : International Conference on Structural Engineering

Conference Location : Singapore, Singapore

Conference Dates : March 30-31, 2014