

## The steel roof of the new Lille Stadium. Its mechanical scheme, assembly and erection sequences

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### Abstract

The steel roof of the stadium of Lille, whose total area is approximately 50,000 m<sup>2</sup>, is generated by simple cylindrical and spherical shapes. The stadium is able to welcome fully indoor or partly covered events thanks to a 120 x 80 m<sup>2</sup> movable roof. Valode & Pistre and Pierre Ferret are the architects of the project, Greisch, the engineering office and Eiffage Metal, the steel construction company.

The roof is supported by two 200 meter long and 16 meter high mega-trusses. The main characteristics of the project are the technique used to assemble the mega-trusses members (single pins and prestressed steel members) and the erection method (lifting). Both were chosen with the same goal: saving time. The new stadium was completed in only 2 years.

**Keywords:** stadium; structural schema; joints; contact; pins; post-tensioning; erection

### 1 Introduction

The Pierre Mauroy Stadium is a multi-purpose arena able to host sport competitions or cultural shows. It is 36.5 m high, 235 m long and 194 m wide, Fig. 1. The stadium can accommodate 50,186 seats including 7,000 business seats and 450 seats for disabled persons.

It can be used in two different configurations.

With full capacity, the stadium is a venue for football and rugby competitions.

In the second configuration, half of the football field can be lifted up with hydraulic jacks and then slid above the other half of the field, in a matter of

hours. This configuration offers a new volume where supplementary stands are installed; the mobile roofs are moved in 20 minutes and vertical curtains are rolled down from the roofs to close half of the volume of the stadium. The capacity is 30000 seats and it is a venue for basketball, tennis, music shows, etc.

The stadium was one of the venues of the UEFA Euro 2016.

Eiffage began the construction of the arena in march 2010 and the stadium was completed during the summer 2012.