

## A three-core high-rise in Paris

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As a civil engineer and architect, Audrey loves to draw, design and calculate.

She worked in bi-cultural offices in New-York, before joining Setec where she managed the Court project from competition to construction. She also gives classes on prestress calculations.

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### 1. Introduction

The Future Paris Law Court is under construction. The project is a 160m high rise designed by Renzo Piano Building workshop and was carried out as a Public-Private-Partnership (PPP): the building is built by the Private Partner Bouygues, maintained by the private Partner Exprimm during 27 years, before being returned to the Public Client, the EPPJP.

The design competition started in August 2010 and the building will open in June 2017.

### 2. Content

This highrise has very interesting particularities:

- With a width/height ratio of 13, it is very slender and required wind tunnel testing.
- Due to its 150m long base, it was split into three structural blocks, having their own central concrete core. In order to prevent transversal differential movement, while allowing longitudinal displacement, we came up with an ingenious mortise and tenon connection in plan in the slabs.
- Specific 3D geotechnical studies were carried out to quantify the effect of the ground settling under one core relative to the other cores, and to the surrounding buildings.
- The cores have various heights, so the wall thicknesses were adjusted in order to minimize the differential shortening under elastic strain, creep and shrinkage.
- On terrace levels 10, 20 and 30, in order to suppress peripheral columns, transfer cantilever floors were designed in prestressed concrete.
- This project was the first big scale project of our firm to be entirely modeled in 3D with REVIT, as a tool to coordinate with the other partners, and to produce structural drawing plans.



### 3. Conclusions

Behind the classic design of the building, are hidden several thrilling engineering issues. Close cooperation between Setec and the Architect resulted in a well-balanced, sound, and elegant structure.