The building is composed of three main materials: concrete, steel, and glass.

Engineer, partner, and manager at GEC ingénierie, Pressler, concrete with hollow-core slabs was selected to optimize the thickness of the concrete as a structural material while taking into consideration its necessary thermal and acoustic performance, according to Weill.

A steel frame forms the remaining third of the building and is used to create a cantilever along one full side of the building, according to Weill. Steel was selected for this section as a better option than concrete because of its ability to support heavy loads in such a design without cracking or deformation, he notes. The structural design was incorporated into the global architectural design of the building early in the process so that the cantilever would not introduce tension forces into the concrete piles under the building, according to Weill. Because of this, expansion joints and the necessary dead loads were incorporated into the design from the beginning to manage the cantilever's tendency to rotate. Doing so saved the project unnecessary expense and ensured the cantilever only introduces compression forces to the piles, he says.

The steel-and-glass facade encloses the sides and top of the building. The facade protects the interiors against heat gain and has been designed to limit the thermal bridges between itself and the building. The facade's cross bracing also serves as a secondary structural system for the building, according to Weill. Columns—500 in total—that extend from the building's rooftop support the facade roof. These are attached by hinged connections, rather than fixed ones, to minimize the thermal gain transferred from the facade to the main building, he notes. Triangular columns on the rooftop give transverse stability to the facade's roof structure, which then becomes a curtain wall facade extending down the building's sides.

Incorporating the structural design early in the design process also enabled it to become a nearly invisible part of the architecture, so that the interplay of light, sky, and river on the glass panel could be the visual highlight of the building, according to Weill. —Catherine A. Cardno, Ph.D.