Case study
Timmerhuis, Rotterdam

Client: Ontwikkelingsbedrijf Rotterdam [OBR] / Heijmans Utiliteit

Architect: OMA [Office for Metropolitan Architecture]

Main Contractor: Bouwbedrijf Heijmans N.V.

Consulting Engineer: Pieters Bouwtechniek

Decking Installer: Kempen Cladding B.V.

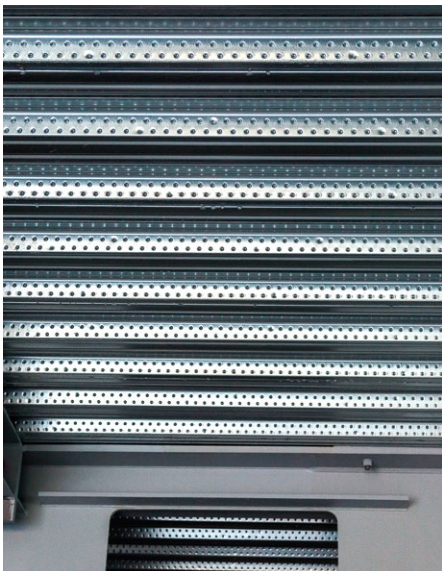
Tata Steel products: ComFlor® 80, ComFlor® 60 and ComFlor® 210 [supplied by Tata Steel's distributor Dutch Engineering r.i. B.V.]

Year: 2015

The Timmerhuis is a highly architectural steel-framed modular extension to Rotterdam's city hall offices and the most sustainable multi-functional building in the Netherlands.

It is formed by a series of stacked cubes that are set back from the street and rise into two irregular peaks.

Conceived by the Office for Metropolitan Architecture the mixed-use building is composed of offices and residential units, and is said to create an impressive, complex form when viewed from Coolsingel, one of Rotterdam's main arteries.



The challenge

The project's design went through a rigorous sustainability assessment, starting with microclimate analysis. The building's form was optimised for daylighting, thermal comfort, energy use and water conservation and it achieved a BREEAM 'Excellent' Sustainability Certification.

The Timmerhuis's innovative structural system generates maximum efficiency and versatility both in construction and in programme as units can be added or even dismounted from the structure as demands on the building change over time.

The aim was to build with future flexibility in mind by creating a building that can be adapted to either office space or residential parameters as desired, or even total disassembly. Green terraces on higher levels provide the option of an apartment with a garden in the heart of urban Rotterdam.

Dutch Engineering had been involved from the early stages of the design process, when Pieters Bouwtechniek and the architect were considering the various flooring systems available on the market.

Speed and ease of construction were of the upmost importance to the project team and a flooring system that could easily be incorporated with the steel frame was vital to the design.

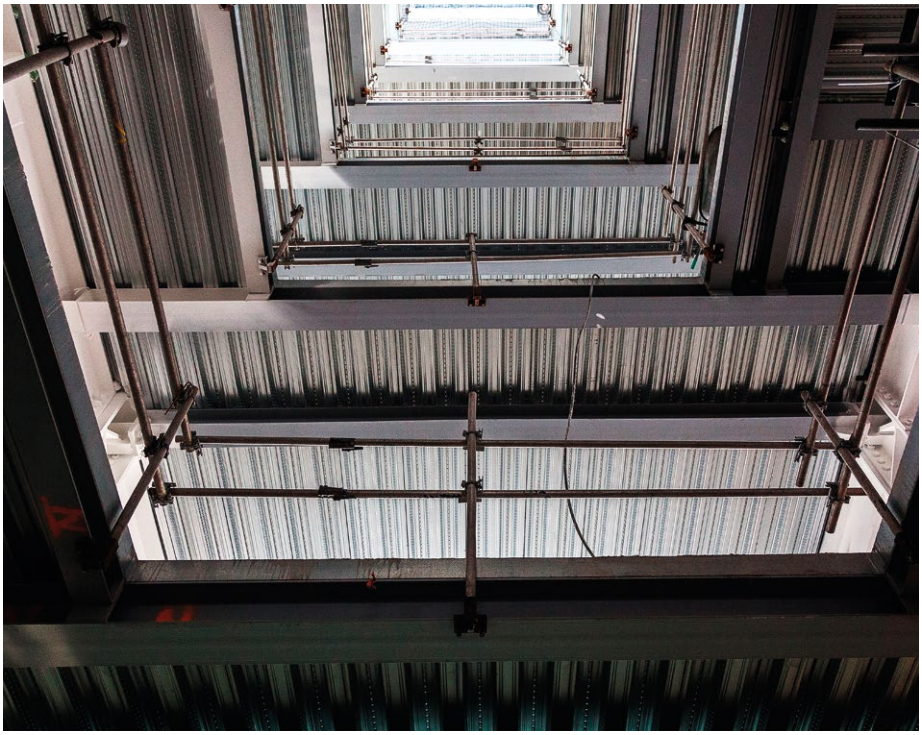
"A cost-effective flooring solution was required, one that would achieve long spans and the load requirement, with a low concrete volume, thereby removing the need for temporary propping," explains Henk Prins of Dutch Engineering, Tata Steel's distributor.

Tata Steel products:

ComFlor® 80 is a round shouldered 80 deep trapezoidal profile to give long spans. The use of this profile allows a designer to reduce still further the number of secondary beams in a building.

ComFlor® 60 has been much copied but never bettered, as the original new generation round shouldered trapezoid combined 60 profile. This design is exceptionally resistant to compressive buckling resulting in superior span capability compared to traditional decks.

ComFlor® 210 the original deep composite profile introduced for the first Slimflor systems with a very effective span to weight ratio.



The solution

Using ComFlor® composite floor decking helped ensure the best possible solution for the project. ComFlor® scored highly for all of the project's required needs and was the preferred flooring option out of five available flooring systems put forward, based on its light weight and cost.

"The design team's comprehensive floor system evaluation required a flooring system that would fulfil the required design brief requirements. The build required a flooring system that provided strength, achieved the load and span requirements and one that offered a fast build at great height was not forgotten in this decision process," adds Mr Prins.

The flooring solution was completed using 20,000m² of ComFlor® 80 in 0.90mm and 1.20mm gauges, 5,000m² of ComFlor® 60 in a 0.90mm gauge, as well as 825m² of ComFlor® 210 in a 1.00mm gauge, all supplied by Dutch Engineering.

Jan Neele, the Project Consultant for the flooring solution further explains the decision to use ComFlor®. "The system's combined light weight attributes along with structural strength was vital on the cantilevering areas of the project.

"The compositely formed slabs were used in the composite design of the secondary beams, as lateral restraints for the beams and for diaphragm action, which gave the steel frame its stability."

For more information on our structural products and design advice please contact a member of our design team on +44 (0) 1244 892199 or email technical.theworks@tatasteel.com

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