
The curved facade of the corporate headquarters at night. (©Thilo Ross)

A declaration of love for concrete HeidelbergCement's new Group headquarters

HeidelbergCement is one of the world's largest manufacturers of building materials. With the new headquarters, the DAX-listed company from Heidelberg has demonstrated the remarkable range of possibilities for concrete as a building material. The consulting engineers from Wulle Lichti Walz GmbH were responsible in the design of the impressive building and provide insights into their work.



Concrete – Headquarters impresses

... construction of a new corporate
... range of concrete as an attractive
... the planning team for the structural

Tim Kullmann

For a long time, the employees of HeidelbergCement were spread across various office buildings in the Heidelberg city area. To put an end to this situation and bring the entire workforce together at a common hub, the Group built a new, impressive corporate headquarters in the Neuenheim district of Heidelberg. The modern new building, which was occupied in June 2020 as planned after three years of construction, offers space for up to 1,000 employees. During the planning and construction, however, HeidelbergCement not only placed importance on sufficient capacity for its workforce, but also on an innovative and energy-efficient building concept. The certification of the building according to the "Platinum" standard of the German Sustainable Building Council testifies to the environmentally friendly and sustainable construction method.

Facade and foyer form highlights

The complex covers a gross floor area of 51,975.60 m². It is composed of three cube-shaped building parts of different heights, which are interwoven and merge into one unit. The corporate headquarters with seven floors above ground and two underground floors is designed as a reinforced concrete skeleton structure with reinforced concrete circular columns and bracing wall cores. The integral structure, which only has joints at the two ends of the bridges on the 1st and 2nd floors, has a total of 182,418.20 m³ of enclosed space. In addition to the generously designed interior, separate, lavishly landscaped inner courtyards and the company's own canteen (the casino) contribute to a comfortable and communicative working environment. When selecting the materials, the DAX-listed company was particularly keen to showcase the versatile and aesthetic application possibilities of concrete as a building material. The guiding principle in the design and planning was that the new headquarters should reflect the company and its products. The first lasting impression is left by the curved façade, which conveys an inviting transparency as a mixture of a lot of glass and white precast concrete elements.

This remarkable appearance is continued in the entrance area. The self-compacting fine

concrete of the highest exposed concrete class SB 4, which was used there for the partially filigree and densely reinforced exposed concrete components (walls, columns, ceilings), radiates harmony, elegance and lightness. Architectural and static highlights are the three eleven-metre-high tree supports made of reinforced concrete that stand in the room and transfer the load from the storeys above. The special construction, as slender as it is complex, owes its name to its outer shape, which resembles that of a tree.

Load transfer via the building model

As part of the building design, the consulting engineers from Wulle Licht Walz GmbH were responsible for the structural support of the building. Based on a 3D model previously drawn in Allplan, they first determined the load transfer of the entire building with the help of the FRILO programme Building Model GEO. "The GEO was a great help because it helps to give the user a quick overview of the vertical load transfer, especially with complex building structures," says Dipl.-Ing-Oliver Lichti, who placed vertical supports in the building model contrary to the actual shape of the inclined tree supports in order to create a support point and simulate the transfer of the load. "Once the information is in the GEO, changes can be made easily. With special connection solutions, the details can then be worked out," adds the structural engineer.



The ceiling above basement in the FRILO Building Model GEO. ©FRILO

Component dimensioning of the upper floors

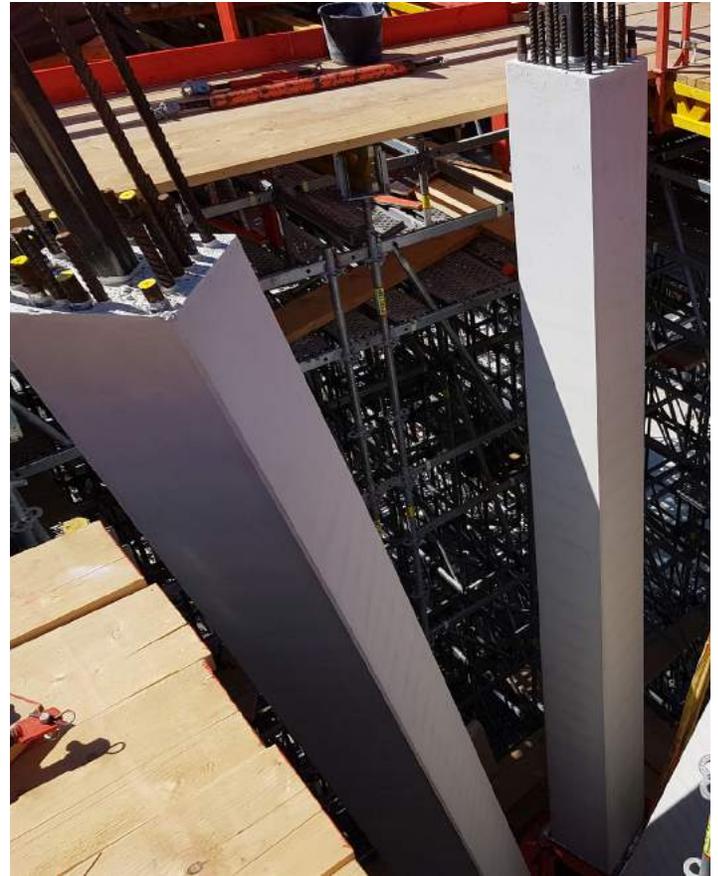
After determining the load transfer, the building model was divided at the ceiling above the basement in order to process the two basement floors and the seven floors above them separately from each other during the structural component design. The structural analysis of the slabs took place after the transfer from the building model in the FRILO programme slabs with finite elements PLT. For the design of the reinforced concrete beams, the programme Continuous Beams DLT was used. Especially for the calculation of the casino ceiling with its fan-like beams from two sides, which spans an area of 34.65 x 14 metres without supports, both programs were a great help. To form the sharp edges, 64 custom-made hollow bodies with slightly conical edges were placed on the formwork, which could be removed downwards during striking. With the solution reinforced concrete column B5+, the verification for uniaxially and biaxially loaded reinforced concrete columns and walls was carried out. For the spatial calculation of the tree supports, the responsible persons resorted to a framework programme. In total, the structural engineers involved drew almost 3,600 reinforcement and 2,000 formwork plans. "These are huge dimensions, which our office had never done before, especially in view of the tight schedule," Lichti admitted.

Change of system in the basement

As is usual in projects with an underground car park, a system change was made for the slab above the basement. The slab that rests on the basement has a thickness of 50 to 100 cm and absorbs the loads of the upper floors via a beam grid. The beams are so highly reinforced that they could not be concreted together with the slab. Four layers of diameter

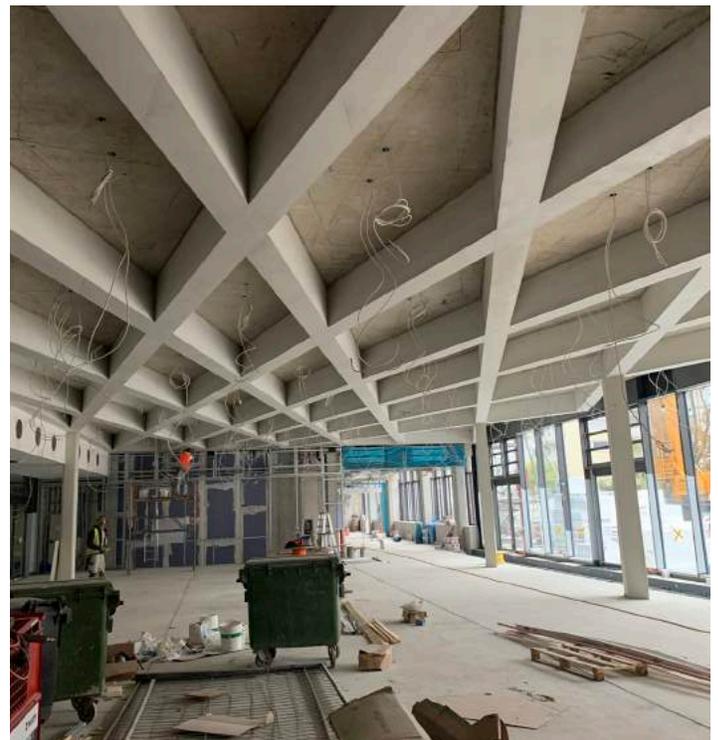


Three eleven-metre-high tree supports adorn the foyer. (©Thilo Ross)



The head point of the tree support with connection reinforcement in the ceiling above the foyer. (©Wulle Lichti Walz)

32 were used in the floor slab in the basement floors. Because of the roadway in the underground car park, neither beams nor columns could be drawn in in the area of the tree supports located in the foyer in the basement. Consequently, a Europilz of almost 22 tonnes and supplementary HALFEN shear reinforcement was installed in the ceiling above the basement under each of the three tree supports. For the tree supports on the ground floor, the self-compacting C50/60 concrete was pumped into the supports from below with the help of welded-in baffles and pressed upwards into the formwork eleven metres. "In terms of concrete technology and statics, this procedure was a real challenge. It is unbelievable to see what is already technologically possible when dealing with concrete," enthused Lichti, who will probably always remember his decisive involvement in the new construction of the HeidelbergCement Group headquarters.



The casino ceiling with fan-shaped beams. (©Wulle Lichti Walz)

