



New “hood“ in central Berlin 02 | 23

QH Track in Berlin: Around 2,000 tons of carbon dioxide saved thanks to floor slabs with voided slab technology

In the middle of Berlin, a „new hood“ is currently being built on a large construction site - the „Quartier Heidestrasse“. The long „QH Track“ building is nearing completion. For this, a total of around 100,000 square meters of floor slabs were constructed with Cobiax void former modules. And not without reason: concrete savings of up to 35 percent are nowadays a strong argument both ecologically and economically. At the heart of the neighborhood is the local shopping center, which, with its surrounding cafés and restaurants, creates a pleasant living and working environment.

In designing the „QH Tracks“ building structure, the Zurich and Berlin-based architectural firm EM2N focused on a warehouse building complex with rooms up to four meters high and long-span floor slabs. Normally, such projects require a lot of reinforcing steel and a large slab cross-section - but there is another way: less concrete and

steel ensure a reduced dead weight. Together with Cobiax Deutschland GmbH (Bielefeld), the Berlin branch of the construction company Zech Hochbau AG (Stuttgart) developed a modern concept using the special Cobiax void former technology.

Void former technology saves up to 153 liters of concrete per square meter

Long-span slabs are not uncommon in office construction, but they require a high level of bending stiffness. A slab thickness of up to 50 centimeters is therefore not unusual - of which a maximum of 40 percent is used statically. In a normal implementation of the QH track with a floor slab area of over 100,000 square meters, 8,000 cubic meters of concrete would therefore not have been used in a statically effective way. This is accompanied by an additional load on the foundation of a whopping 20,000 tons. In fact, only



Practical where storage space is limited: Cobiax void formers of the „Cobiax SL“ type are delivered in component parts and can be easily assembled on site to form modular bars.
Source: Cobiax, Bielefeld.

slab areas that are exposed to high shear forces have to be filled with solid concrete - this corresponds to only around 30 percent of the total slab area.

Against this background, it was decided to implement the floor slabs as voided slabs - and to do so with the market leader Cobiax from Bielefeld. Cobiax has been working intensively with voided slab technology for several decades. For the construction of the QH Track, the project managers opted for the „Cobiax SL“ modular system - ideally suited for slab thicknesses of 22 to 56 cm, with void heights of 10 to 26 cm being built up. In each case, six void former modules, which are connected to each other in their position via lateral steel grids, are fixed to the lower reinforcement for this purpose. After the upper reinforcement has been placed on the void former modules, the slab can be casted. By using the „Cobiax SL“ modules, 53 to 135 liters of concrete per square meter can be saved, depending on the slab thickness - this corresponds to a load reduction of 132 to 337 kilograms per square meter.

Easy handling when using „Cobiax SL“ modules

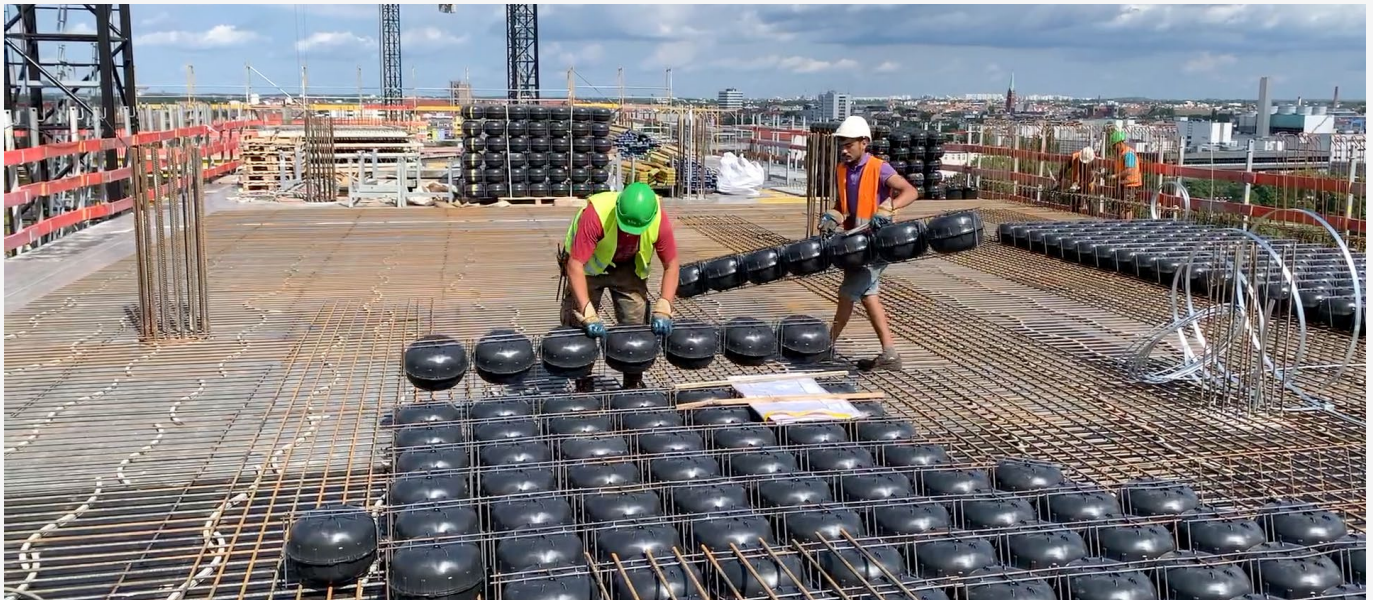
The modules also offer great logistical advantages: No finished installation elements were supplied, but rather half-shells stacked inside each other, with the associated ladder-shaped steel grids for assembling the ready-to-install void former modules. The depot built especially for the construction project also functioned as an assembly hall. Thus, true to the motto „assembly just in time“, the half-shells were placed on top of each other and locked in place, and then snapped into the fixing elements. This was done by a two-man team assembled by a subcontractor. After a short adaptation period, their module output was around 250 pieces per day.

With the help of the installation plans supplied by Cobiax, the low-weight modules including shortened fixing elements could be easily installed by hand. The entire process - any shortening of the elements as well as the final fixing - does not take any longer than the setup with the otherwise required distance reinforcements, but in addition offers a significantly more stable grid structure that is also easy to walk on.

Casting using the Cobiax voided slabs was carried out in



The void former modules are placed on the floor slab by crane and precisely laid by hand. Thanks to their low weight, only two people are needed for this activity.
Source: Cobiax, Bielefeld.



The simple design of the „Cobix SL“ system also allows new workers to be trained quickly and at short notice - by means of training videos or on-site instruction. Source: Cobix, Bielefeld.

two steps: First, the lower reinforcement layer was concreted in place - then, in the second step, the „Cobix SL“ modules including the upper reinforcement. An F4 concrete was used for backfilling, which is considered easy-flowing and was therefore able to reach all the voids. „If a void former floated up slightly, it was simply pushed back into the concrete, and that’s where it stayed,“ explains senior foreman Peter Roy of ZECH Hochbau AG. Compaction was

carried out as usual. There is sufficient space between the voids for inserting the vibration-cylinder. Gravel pockets did not occur more frequently than with standard reinforced concrete slabs. Although the production of a concrete slab with the Cobix system installed is slightly more time-consuming, it was still possible to complete one slab per day. According to Roy, there were therefore no delays.



Concreting in two steps: First, the bottom reinforcement layer, to which the void former modules are attached, is concreted. Then the concreting of the slab is completed.

Quelle: Source, Bielefeld.

Complications arose in individual cases during subsequent installation work. For example, void formers were inadvertently drilled so that rainwater or condensation collected there. The water was then sucked out and the holes sealed. According to Peter Roy, some void formers burst open due to frost, but this could only be detected during stripping. These were then sealed from below and filled with concrete.

Savings of 2,000 tons of CO₂

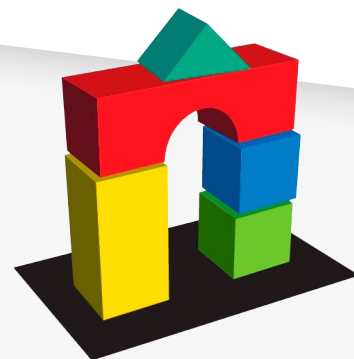
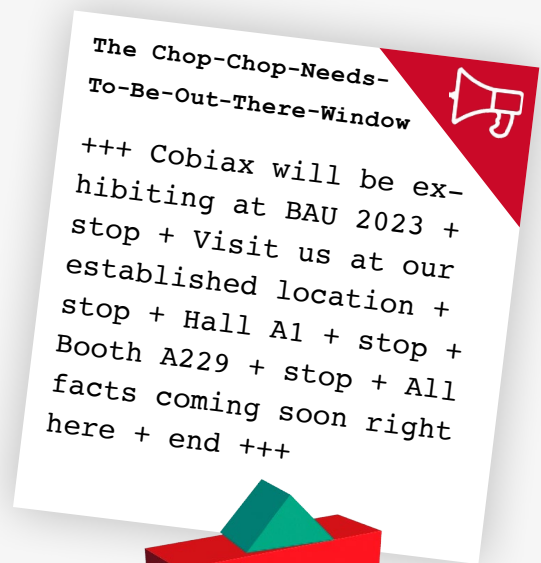
Architecturally and economically, the QH-Track building complex offers many advantages. However, the focus of the planning was the ecological approach. The production of concrete and steel is extremely energy-intensive and therefore releases large amounts of carbon dioxide. For an area of 100,000 square meters, the use of the void formers saved a good 2,000 tons of CO₂. The Cobix modules are made from 100 percent recycled plastic.



Ecological and economical shell construction: Cobiax void former modules are made entirely of recycled plastics and enable concrete savings of up to 35 percent. Source: Cobiax, Bielefeld.

Due to economic as well as ecological advantages, Peter Roy, the senior foreman in charge, is optimistic: „These are certainly not the first and last Cobiax voided slabs we have built.“ Cobiax technology has already won several awards. In 2010, the company won the Swiss Environmental Award in the „Technical Innovation“ category, as well as the „German Material Efficiency Award“ presented by the German Federal Ministry of Economics and Technology. This was followed in 2013 by the Research Prize for Sustainable Development awarded by the Federal Ministry of Research and Education.

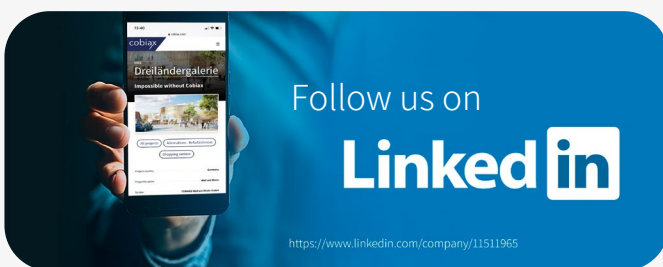
More information on the web at: [cobiax.com](https://www.cobiax.com)



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