Bild:

**Photo** Foto**:** Jakob Schröder

**Location** Ort**:** *Hamburg, DE*

**Date** Datum**:** *Jun-21*

**Editor** Autor**:** *Franziska Brielbeck*

**Structural engineering: The SENNEBOGEN 643 telescopic mobile crane in use in the construction of a new city district in Hamburg's HafenCity**

**As part of the urban megaproject "Westfield Hamburg-Überseequartier", a completely new urban district is to be built in Hamburg within just three years. The construction company Leonhard Weiss has been commissioned with the shell construction of the "Core Southwest" section, where an underground car park with two floors is to be built. Where the other construction cranes reach their limits due to the massive weight of the components, the flexible 40 t SENNEBOGEN 643 E telescopic mobile crane is used in structural engineering and assembles the steel beams weighing several tons.**

The new construction of “Westfield Hamburg-Überseequartier” as an integrated district and central part of Hamburg's HafenCity encompasses dimensions that are difficult to comprehend: By 2023, a lively and attractive space for living and working is to be created on an area of approximately 419,000 m², with diverse cultural, shopping and leisure facilities – a dynamic "mixed-use district," as urban planners put it. With an investment of more than one billion euros, 14 new buildings and, as a highlight, an innovative cruise terminal will be realized. Both construction sites of the complex are also to have a two-story underground parking garage, so that in the future around 90,000 m² of parking spaces can be made available for residents, commuters and visitors. The building company Leonhard Weiss is also involved in the construction of this huge parking garage. For the demanding structural engineering works, the company is specifically using the 643 E telescopic mobile crane from SENNEBOGEN, which they rented from the local SENNEBOGEN dealer Friedrich Niemann.

**A building construction with architectural and logistical challenges**

The complex architecture of the structures also confronts the company with some challenges in the construction of the underground parking garage, as in many cases it is not possible to pass loads vertically downwards because of the already existing reinforced concrete cores and columns. A logistics concept is therefore worked out to enable the planned columns and beams to be moved to their intended location. A central component in the implementation of the concept: the compact 40 t telescopic mobile crane from SENNEBOGEN.

**Limited space and load-bearing capacity of the unfinished floor construction determine the work on the construction site**

As there is no direct access to the basement yet, the 643 Mobile first has to be lifted into the 16 m deep excavation pit at a suitable location. From there, this maneuverable powerhouse, which is still less than 3 m wide even with twin tires, can drive directly to the respective location thanks to its mobile undercarriage and install the 11 t or 13.5 t steel beams. Also the driving maneuvers to be carried out here proved to be particularly tricky. A total of 1,600 heavy-duty props reinforce the site and the travel route on the already concreted underground parking garage ceiling so that the load-bearing capacity of the ceiling is guaranteed from a static point of view. For safety reasons, the mobile crane has to navigate on a strictly prescribed "road", i.e. exactly on the sub-scaffolding, while also keeping an eye on the already standing columns and props.

On the other hand, it is also the lifting activities themselves that require extreme accuracy. When lifting the steel beams, the mobile crane must be positioned on precisely measured points so that the outrigger feet are directly above the heavy-duty props and the high support load can be absorbed. Equally precise requirements then apply to the positioning of the beams on the columns. A major advantage here is the Full Power Boom, which can be force-locked and continuously telescoped even with load on the hook, automatically ensuring the best load capacity at any boom length. Site manager and fitters of the construction company are very satisfied with the performance of the telescopic mobile crane as well as the support provided by Friedrich Niemann and are looking forward to the further work within the scope of this impressive mega project.

**Captions:**

Picture 1: *The compact 40 t telescopic mobile crane is ideally dimensioned for the tight space conditions in the excavation pit.*

Picture 2: *The positioning of the reinforced concrete beams, which weigh almost 14 t, on the columns and walls requires enormous precision.*

Picture 3: *At the beginning, the telescopic mobile crane has to be lifted into the excavation pit, as there is no direct access to the basement yet.*