OBM Hampton by Hilton

07.11.2018 / Deutschland / Christoph Herborg

Building construction

Factbox

Employer: Lambert Wohnbau GmbH, Regensburg

Contractor: PORR Deutschland GmbH, ZNL Berlin

Project Type: Building construction, Hotel, Residential construction

Project Scope: Turnkey construction of a hotel and residential building

Order Volume: EUR 27.5 million

Construction Start: 09/2015

Construction End: 08/2017

Location: Berlin

In summer 2015, PORR Deutschland was awarded with a lump sum contract for the turnkey construction of a 10-floor hotel and residential building in Berlin-Mitte.

The largest Hampton by Hilton hotel in the world stands just a few minutes on foot from Alexanderplatz. The central location has many benefits for the guests, but not necessarily for the construction team.

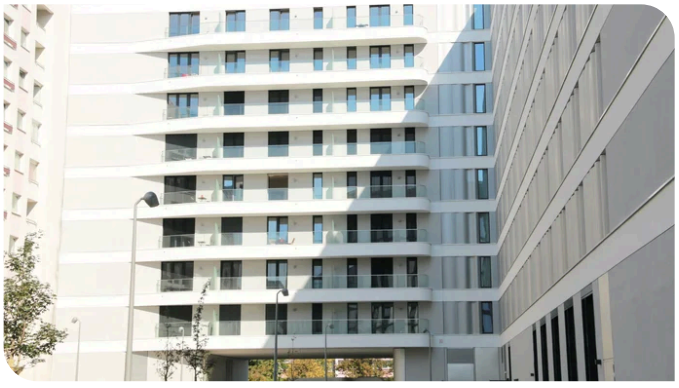
General & Initial situation

In spring 2015, construction started on the new Hampton by Hilton hotel in the heart of the German capital. With 344 rooms, a block with 40 rental apartments and a gross floor area of 19,000m², it was to be the largest of the brand's hotels worldwide. The L-shaped building extends right up to the perimeter of the construction site and creates a half-open inner courtyard with green space and play areas. The execution planning was provided by the employer, Lambert Wohnbau GmbH. The complex consists of a basement (part of which is used for underground parking), a ground floor, and eight upper floors. It opened in May 2017.

For decades, the 4,200m² site stood undeveloped. Before the war, there was a main road and a few residentialbuildings. In the post-war years, it was left empty and used only as a car park, not least because of soil contamination. Due to the former road layout, various utilities cross the construction site, which had to be considered during planning and construction. These include a mixed water channel of 2.8m in diameter, an 80cm diameter fresh water pipe, as well as various gas, telecommunications, traffic signal and broadband lines. Furthermore, an additional strip of the construction site was to be kept free for a possible extension of metro line 3.

> Thanks to our excellent cooperation, we were able to realise numerous special solutions on the cramped construction site.

Christoph Herborg
Project manager



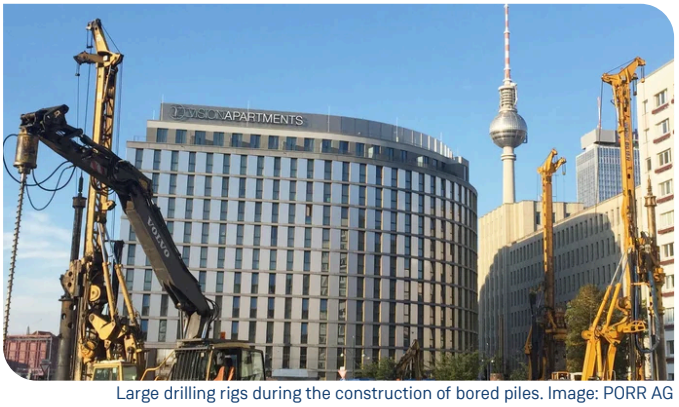
The project
Bridge construction in the residential wing

Against the background of the median-crossed subsoil and the necessary revisions, parts of the property could not be built on. It was also necessary to construct part of the building as a bridge structure, as this area was also excluded from construction.

Due to the large proportion of openings in the outer walls, it was not possible to transfer the load on the first floor alone. In order to maintain the slenderness of the load-bearing structure and thus the same ceiling heights as the neighbouring hotel, around 200 tonnes of steel composite beams were used to transfer the load on all floors above the passageway. This resulted in reinforced concrete composite beams on each floor along the four main longitudinal axes of the building. All internal and external walls in the projection area of the passageway were designed to be non-load-bearing. Each floor thus spans the passageway area in a mathematically self-sufficient manner. Despite the delicate design of non-load-bearing walls for foundation work reasons, all sound insulation requirements were met and exceeded.

Another challenge of the bridge construction was the relatively small foundation area on one side. Here, the PORR specialists were confronted with two problem areas: On the one hand, the underpinning of the neighbouring gable by means of high-pressure injection (HDI), which is usually used in such cases, was not permitted by the owners, so that instead an overlapping bored pile wall with a steel reinforcement on two levels was used to secure the construction pit.

On the other hand, the footprint of the 10-storey tower block in this area was not sufficient for a shallow foundation. For this reason, additional foundation bored piles with diameters of 75, 88, 119 and 150 cm were used. The drilling diameters of 1.50 m and the pile length of 30 m necessitated the use of large drilling rigs up to BG 28. Due to the large number of boreholes required and the tight runtime, up to four large drilling rigs were on site at the same time.



Large drilling rigs during the construction of bored piles. Image: PORR AG

Vibration decoupling of the hotel building

When main traffic arteries and the public transport network meet, vibration and noise cannot be ruled out. Precautions had to be taken to protect guests as well as residents. A physical and secondary airborne noise analysis was carried out during the planning phase. As a result, an elastic building support was recommended so that the vibrations from the trams would not be transmitted to the building structure via the ground. Full-surface decoupling mats were laid along the course of the road under the floor slab and in the area of the outer walls of the basement to prevent the transmission of unwanted vibrations to the building.

Another challenge of this construction project was the groundwater above the floor slab. The closed-cell elastomer Sylodyn, a material for vibration protection, was selected and dimensioned accordingly on the basis of the existing parameters - such as soil pressure, vibration frequency, position in the groundwater and compatibility with the fresh concrete composite foil used in addition to the white tank. The effectiveness of these measures was confirmed both by vibration measurements and by the positive feedback from hotel guests.

Detailed views of the perforated sheet façade with "raised curtains". Image: PORR AG

The wave-optic façade

The façade is divided into horizontally continuous parapet bands with a fine plaster structure and an anodised aluminium perforated sheet façade in between. The wave-like appearance is intended to symbolise a "drawn-up curtain". The façade spans one sash of each of the double-sash, almost floor-to-ceiling windows. Not only vertical wind forces act on the curved shape, but also those that run horizontally to the façade. In order to guarantee the verification of the force transmission for the PVC-U windows used on the upper floors, an extruded aluminium profile was developed especially for the building project, which encloses the window centre mullion on the outside and thus ensures the required rigidity of the overall construction. This allowed the wave shape desired by the architect to be realised with a great deal of expertise.

Prefabricated reinforced concrete bathrooms for the hotel

With the exception of the barrier-free bathrooms, all hotel rooms were fitted with prefabricated reinforced concrete bathroom cells. In contrast to a lightweight bathroom cell, the reinforced concrete cells could be finalised during the shell construction phase. In addition, the bathroom cell wall can also be designed to be fire-retardant and fire-resistant. As the cell requires less protection from the weather than a lightweight bathroom cell, this is a decisive benefit for the speed of construction. As a result, it was possible to connect the bathroom cells to the risers only slightly offset to the progress of the shell construction and to significantly optimise the construction time.

Production of the prefabricated bathroom cells made of reinforced concrete. Picture: PORR AG

Technical data

Gross floor area	**19.000 m³**
Concrete required	**5.000 m³**
Steel reinforcement required	**1.500 t**
Building units	344 hotel rooms, 40 apartments
Excavated soil	9.000 m³
Equipment	2 rotating tower cranes; 4 drilling rigs
Special features	Vibration-isolated building suspension

Conclusion

On a very difficult building site, PORR erected a striking building that blends in well with the neighbouring architecture. Thanks to the excellent teamwork of the construction site team, the construction and scheduling challenges were mastered superbly.