

# The CopaBeach on the Danube Island in Vienna

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## Civil engineering/ Infrastructure



## Factbox

**Client:** Wiener Gewässer Management GmbH

**Contractor:** PORR Bau GmbH, NL  
Niederösterreich

**Contract Type:** Totalunternehmer

**Project Type:** Civil  
Engineering/Infrastructure, Civil  
Engineering

**Scope:** Restructuring the riverbank and ensuring accessibility by means of construction elements consisting of retaining walls and ramps

**Contract Volume:** 2.2 million euros

**Construction Start:** 01/2018

**Construction End:** 06/2018

**Location:** Vienna

The CopaBeach in Vienna is to be transformed into a modern local resort in three construction phases. PORR completed the demanding first part in record time.

As full-service contractor, PORR was responsible for the execution planning for this project on the banks of the New Danube. The geometry of the double-curved three-dimensional retaining walls and the tight schedule were particularly challenging factors.

In the 1980s, the Danube River was regulated and the resulting spoil was built up to form the Danube Island. This created the New Danube, which was to become a popular local resort for Vienna residents. Over time, the “Copa Cagrana”, a popular area, came into being in the immediate vicinity of the Reichsbrücke bridge. The City of Vienna is now restructuring and modernising this section, which has seen better days, in three construction stages. An EU-wide architectural competition was held, and the winning project features a redesign of the shore which, in addition to a

contemporary, visually appealing surface design, also fulfils the original function of a flood protection measure on the left bank of the Danube.

At the beginning of January 2018, PORR Bau GmbH, the best bidder, was selected by Wiener Gewässer Management GmbH as full service general contractor for the construction of the first section, the CopaBeach. The structural analysis, which was included in the order, and the execution planning were both carried out by PORR Design and Engineering GmbH.

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No handle was the way it always was. Hardly recognizable to the layman, but the project was technically challenging.

**Constanze Mitterer**  
Site manager, PORR Bau GmbH

## Planning and demolition



The public viewing of the World Cup, scheduled for June 2018, determined a clear time-line for work on the first construction stage. Source: PORR

The main challenges presented by the project were the unusual geometry of the special retaining walls and the tight schedule. After all, the city beach had to be completed in time for the bathing season. In addition, the investor came up with the idea of showing the FIFA World Cup at the newly designed CopaBeach in June 2018, and applied for the necessary permits. The PORR construction site team had to create the appropriate infrastructure for public viewing, and factor this into their schedule.

The first step, clearing the construction site, involved demolishing the numerous existing steps and retaining walls. All the built-in elements were removed and the terrain was reprofiled and restructured to ensure accessibility. This entailed moving approximately 11,800m³ of earth, of which roughly 6,600m³ were removed entirely.

## Double curves in three dimensions

While the demolition works were going on, PORR drew up the execution plans for the new retaining walls, which display a high degree of technical complexity due to their “double-curved three-dimensionality”. A total of five retaining walls were erected on the construction site to accommodate the difference in height along the embankments on the left bank of the Danube. The largest construction element is the SM-1 retaining wall, which begins at the quay of the New Danube at a height of 3.50m above the top edge of the foundations and becomes increasingly lower before tapering off at the upper edge of the embankment. Seen on the plan, the SM-1 describes an irregular curve before ending in a straight line. The cross-section of the foot of the supporting wall foot is also curved. The SM-1 winds continuously back and forth from the quay before merging into a stairway after 2/3 of its total length. The other retaining walls also feature irregular curves in several directions, but are consistently lower.



PORR erected several retaining walls featuring irregular curves along the embankment area. The largest retaining wall begins at the quay and ends at the top of the embankment (visible in the background). Source: PORR

## Unique exposed concrete



Custom-made formwork was needed to produce the exposed concrete surfaces.  
Source: PORR

For the most part, the architectural concept for the retaining walls specified exposed concrete, coloured yellow and containing a proportion of white cement. During sampling, the aggregates played a decisive part in selecting the concrete that was to be used. Each exposed concrete surface required a custom-made piece of formwork, which could only be used once per square metre.



# Equipped for emergencies

Additional design elements were used when creating the pathways on the embankment. For example, rectilinear retaining walls made of precast concrete elements were fitted with seats, different levels were created in the green spaces and along the footpath boundary lines using Corten steel, and a 500m<sup>2</sup> sandpit was installed.

Since the construction site is located in the flood run-off area of the New Danube, the unpaved areas of the embankment were secured with grass pavers up to flood mark HW100 plus 1m, and covered with humus. The CopaBeach catering outlets are housed in mobile facilities so that they can be removed at short notice in the event of flooding. In a final step, 6,500m<sup>2</sup> of turf were laid out, making the new local recreation area ready for use ahead of time.



The straight retaining walls made of precast concrete elements invite people to linger with seating. Source: PORR

## Technical data

Earth moved	11.800m <sup>3</sup>
Excavation	6.600m <sup>3</sup>
Formwork	1.590m <sup>2</sup>
Site clearance	13.000m <sup>2</sup>
Demolition	7,700t concrete; 1,400t asphalt
Custom formwork, curved	720m <sup>2</sup>
Total concrete	930m <sup>3</sup>
Exposed concrete	395m <sup>3</sup>
Turf	6.500m <sup>2</sup>

## A challenge for the team

The technical complexity and tight schedule of this unusual construction project presented a challenge for the project team during every stage of the construction – designing the formwork and reinforcements, construction

preparations and, ultimately, the execution. Nevertheless, PORR managed to overcome the technical challenges within the scheduled construction period.