

# Kinked façades for high-rise towers in Hamburg

The envelope swings around the Tanzende Türme (Dancing Towers)

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The Tanzende Türme (Dancing Towers) in Hamburg are being clad with kinked facades constructed from aluminium and glass. The facades of the 90 and 80 meter high towers are inclined at different angles. The towers located at the entrance to the Reeperbahn were designed by Hadi Teherani to resemble a dancing couple. At the beginning of November Josef Gartner GmbH installed the last of the large units onto the upper office floors of the tower.

## Dancing Couple at Reeperbahn 1

In 2003 the Iranian Architect Hadi Teherani, from the Hamburg firm of Architects BRT Bothe Richter Teherani, won the competition for development of the 5.400 square meter space. As a dancing couple, at Reeperbahn 1, the Towers should embody the connection between music and sex. According to Teherani, up to now this globally famous road, the Reeperbahn, had been missing this vertical dominant.

Where the towers dance today, was the location of the legendary dance hall "Trichter" dating back to the 19th Century. The road bordering the site on the south, "Beim Trichter" is today still named after this dance hall which was bombed during the war in 1942. In 1958 the concrete construction for the Astra Bowling Club was erected here and from 1991 to 2003 was utilised by the legendary Mojo Club who brought dance floor jazz to Germany and to the European continent. The Mojo Club will again take up occupancy in the Tanzenden Türme.

The main occupant of the 22nd floor north tower and the 24th floor south tower is the STRABAG Group who are also the owners of the building. The main contractor is Ed. Züblin AG. The hotel "Arcotel Onyx" with 215 rooms will occupy the eighth floor with a 25 meter high podium. The construction, which commenced in autumn 2009, with a gross floor area of 33.357 square meters should be completed in summer 2012.







### **The Primary Façade is inclined at an angle of up to 7 degrees**

The 19,000 square meter façade which takes on the dynamic of the “dancing building form”, provides excellent wind, weather, sun and sound protection as well as an optimal view of the Hanseatic City. Standard units measure 2.80 by 3.45 m and weigh around 700 kilogrammes. The largest elements measure 2.80 by 5.40 meters and will be installed onto the uppermost service floor of the south tower (24th floor). They weigh around 1.350 kilogrammes including passepartout.

The advanced geometric design of the double skin façade is very sophisticated, as the individual units are inclined towards each other at different angles with the inner façade twisted so that it faces towards the outer façade. The façade almost appears to swing around the Tanzende Türme as if performing a *passé double*.

Both approx. 90 and 80 meter high towers are inclined towards each other and are kinked at different heights. As a result the primary façade is inclined up to approx. 7 degrees – from 10 degrees overhead glazing would be necessary. For the façade construction a total of 16 different inclinations had to be considered. It is these inclinations in particular that create the impression of the incredible dancing towers.

Passepartouts made of aluminium including the outer glass pane are fixed and twisted to the inner façade. Passpartouts are open façade components which carry a small outer glass pane. These outer glass panes cover the underlying window sashes and provide a certain amount of rain protection when windows are open.

Despite the inclination, occupants of the towers will nevertheless still be able to open their windows. The building access equipment, for the cleaning and maintenance of the building, runs along the sides of the passepartouts. The passepartouts also conceal a particularly important wind resistant sun shading system consisting of aluminium louvres situated in front of the inner façade which functions up to a wind force of 8.

In contrast to other conventional methods, the Tanzende Türme facades were designed from outside to the inside. To begin with, a 3-D design model of the building envelope was created in order to depict the complex



geometry and the different angles of the façade. The building shell was then, as it were, placed into this envelope.

#### **Double Insulated Glass Units And Outer Glass Pane**

The primary façade has been glazed with anti-fall double insulated glass. The outer pane is 8.76 mm laminated glass out of float with a PVB interlayer, low-E coating at position 4. Inner pane as 5mm fully tempered glass. The glazing has a G-value of 51% and a U-value of 1,1 W/m<sup>2</sup>K.

The outer pane in the passepartout is non anti-fall single glazing with 10 – 19 mm fully tempered glass with translucent linear frit

at position 2. The façade for the plant and equipment facilities on the 24th floor consists of anti-fall laminated safety glass, 20,76 mm laminated glass out of float with a PVB interlayer. The connecting façade has been provided with anti-fall solar control double insulated glass. The outer pane is 10.76 mm laminated glass out of float with a PVB interlayer and solar control coating at position 4, the inner pane is 5 mm fully tempered glass. The glazing achieved an impressive G-value of 35% and a U-value of 1,1 W/m<sup>2</sup>K.

#### **Logistics and Installation**

Gartner commenced installation works in March 2011. From the factory in Gundelfingen on the Donau, 12 façade units and 12

passepartouts each were delivered by truck to the site in Hamburg mornings and evenings.

The units were installed by means of a monorail system. The individual units are secured and vertically transported to the respective floor with an express lift. Here the units are distributed horizontally using the monorail system and finally fixed at the exact installation position.

With the use of the monorail system approximately 2 storeys per week could be clad with the façade. From the 19th floor the units were installed with the help of a crane and partly, because of the particular inclination, using a counterweight beam.