BEIJING NATIONAL AQUATICS CENTER

The National Aquatics Center, with the Beijing National Stadium in the background

Building information

Full name : Beijing National Aquatics Center

City : Beijing, China

Capacity : 17,000

Built : 2004–2007

Opened : 2008

Closed : August 8, 2010, no longer used for competitive swimming

Architect(s) : PTW Architects, CSCEC, CCDI, and Arup

The **Beijing National Aquatics Center**, also known as the **National Aquatics Center**,[1] and nicknamed the **Water Cube**, (simplified Chinese: 北京国家游泳中心; traditional Chinese: 北京國家游泳中心) is an aquatics center that was built alongside Beijing National Stadium in the Olympic Green for the swimming competitions of the 2008 Summer Olympics. Despite its nickname, the building is not an actual cube, but a cuboid (a rectangular box). Ground was broken on December 24, 2003, and the Center was completed and handed over for use on January 28, 2008.[2] Swimmers at the Water Cube broke 25 world records during the 2008 Olympics.[3]

After the Olympics, the building underwent a 200 million Yuan revamp to turn the half of its interior into a water park.[4] The building officially re-opened on August 8, 2010.[5]

Architecture

The National Aquatics Center at night

In July 2003, the Water Cube design was chosen from 10 proposals in an international architectural competition for the aquatic center project.[6] The Water Cube was specially designed and built by a consortium made up of PTW Architects (an Australian architecture firm)[7], Arup international engineering group, CSCEC (China State Construction Engineering Corporation), and CCDI (China Construction Design International) of Shanghai.[8] The Water Cube's design was initiated by a team effort: the Chinese partners felt a square was more symbolic to Chinese culture and its relationship to the Bird's Nest stadium, while the Sydney based partners came up with the idea of covering the 'cube' with bubbles, symbolising water. Contextually the cube symbolises earth whilst the circle (represented by the stadium) represents heaven. Hence symbolically the water cube references Chinese symbolic architecture.

Comprising a steel space frame, it is the largest ETFE clad structure in the world with over 100,000 m² of ETFE pillows that are only 0.2 mm (1/125 of an inch) in total thickness [9]. The ETFE cladding allows more light and heat penetration than traditional glass, resulting in a 30% decrease in energy costs [9].

The outer wall is based on the Weaire–Phelan structure, a structure devised from the natural formation of bubbles in soap lather.[10] The complex Weaire–Phelan pattern was developed by slicing through bubbles in soap foam, resulting in more irregular, organic patterns than foam bubble structures proposed earlier by the scientist Kelvin.[8] Using the Weaire–Phelan geometry, the Water Cube's exterior cladding is made of 4,000 ETFE bubbles, some as large as 9.14 metres (30.0 ft) across, with seven different sizes for the roof and 15 for the walls.[11]

The structure had a capacity of 17,000[9] during the games that is being reduced to 6,000. It also has a total land surface of 65,000 square meters and will cover a total of 32,000 square metres (7.9 acres)[9]. Although called the Water Cube, the aquatic center is really a rectangular box (cuboid) - 178 metres (584 ft) square and 31 metres (102 ft) high.

(Wikipedia)