



Innovative Tile and Stone  
Installation Systems

# The Beijing National Aquatics Centre

## Project Spotlight: July 2008



**LOCATION:**

Beijing, China

**OWNER:**

Beijing State Assets Management Corporation, LTD.

**ARTIST DESIGNER:**

PTW Architects, China State Construction and Engineering Corporation, and the CSEC Shenzhen Design Institute

**TILE CONTRACTOR:**

China State Construction and Engineering Corporation, Haidian District, Beijing, China

**TILE SUPPLIER:**

Gail Architektur-Keramik GmbH, Giessen, Germany

**TILE INSTALLATION SYSTEM:**

LATICRETE International, Inc., Bethany, CT

## The Beijing National Aquatics Centre Water Cube Set for 2008 Olympics

By Eric Carson

On August 8, 2008, the eyes of the world shift to Beijing, Mainland China, for the commencement of the Games of the XXIX Olympiad. Beijing, literally translated as "Northern Capital," is the capital of the People's Republic of China and the second largest city on the Mainland. As an international metropolis with over 11 million people, Beijing has a long and proud history as the political, cultural and diplomatic center of China.

The 2008 Beijing Games, the 29th Summer Olympiad in modern history, will host 10,500 competitors from 202 nations, competing in 302 events. The simple expression, "One World, One Dream," has been chosen to reflect the universal values of the Olympic spirit, as the people of Beijing and China prepare to welcome athletes and spectators from across the globe.

The Games will be held at the Olympic Green on the north part of the Beijing Central Axis, just off Fourth Ring Road, where both athletes and spectators will find a brand new stadium unlike any in the world. The National Aquatics Centre, referred to by most as the "Water Cube," will host all the swimming, diving and synchronized swimming events for the 2008 Summer Games. This architectural wonder realized by the consortium of PTW Architects, China State Construction and Engineering Corporation (CSCEC), and the CSEC Shenzhen Design Institute, ranks right up there with the World's new tallest building - the Burj Dubai tower in the UAE - as the most impressive building project in recent history.

The natter blue Water Cube owns 70,000 square meters (750,000 square feet) of the Olympic Green, consisting of five different pools and seating for 17,000 spectators. The exterior design, the natural cellular formation of soap bubbles in infinite, is manifested with 4,000 ethylene tetrafluoroethylene (ETFE) pillows that heat the building much like a green house, trapping 90 percent of the solar energy that hits it and recycling it to heat the pools and the interior. ETFE at its core is a type of resilient Teflon plastic developed in Germany in the early 1970s. The Water Cube in Beijing is the single largest, most comprehensive and complicated ETFE clad structure in the world at the present time.

The Water Cube, one of the most sustainable venues ever built, was also designed to conserve water, a major issue in North China. The 100,000 square meters (1,076,000 square feet) of ETFE foils (cushions) on the outer surface and roof façade can annually collect 10,000 tons of rain water. The Water Cube will recycle and reuse 80 percent of the water harvested from the catchments on the roof, pool backwash systems and overland flows, reducing its reliance on the district water supply system.

Inside the Water Cube are the five different swimming pools that will host the most important international swimming and diving competitions in the world, all of which were installed with innovative and proven pool installation systems from LATICRETE.

During the planning stage, a different manufacturer was selected to supply the setting and waterproofing materials for the 10,000 square meters (107,600 square feet) of ceramic tile in the pools. However, the LATICRETE China sales team changed all that with hard work and determination. The efforts of the sales team were also bolstered by the environmentally-friendly products supplied. LATICRETE® tile installation materials passed the stringent standards placed on all products being used in building the Olympic venues. Another major reason for the decision to switch suppliers was LATICRETE 9235 Waterproofing Membrane, the industry standard in America for waterproofing applications since its inception in 1963. In fact, LATICRETE, a global leader in the manufacturing of systems for the installation of ceramic tile and stone, provided a similar installation system for pools in Sydney, Australia, for the 2004 Summer Olympic Games.

LATICRETE 9235 Waterproofing Membrane, approved by the IBC (International Building Code), is a thin, liquid applied waterproofing and anti-fracture membrane that offers unmatched performance in pools, spas and continuous submersion applications, without any fear of breaking down or deteriorating. LATICRETE, not in the original specification for the Water Cube pools, convinced the owner, general contractor, and architect by providing test reports and numerous project references of pools installed with the LATICRETE System from around the



globe, thus demonstrating its superiority over the specified system. Since the LATICRETE specification for swimming pool installations ran contrary to the prevailing national specifications in China, LATICRETE worked with the Beijing Construction Commission and proved that the LATICRETE® System was more appropriate for use in such applications and in the process created a new national specification for installation materials in pools.

“LATICRETE has a long history in the tile and stone installation industry, providing high-quality, environmentally-friendly products, technical support, as well as particular systems warranties,” said Ms. Chen Lei, Chief Engineer of the China State Construction and Engineering Corporation (CSEEC). “LATICRETE is especially recommended for its swimming pool installation system. Olympic projects have high requirements for materials, so we finally chose LATICRETE as the installation material supplier. The LATICRETE System Warranty gave us much confidence.”

The China State Construction and Engineering Corporation, at times with a team of 80 of the most highly qualified installers in the region, took over four months to complete the installation of the five different pools inside the Water Cube with the LATICRETE System.

The substrate of each pool was first leveled using LATICRETE 226 Thick Bed Mortar mixed with LATICRETE 3701 Mortar Admix. LATICRETE 226 Thick Bed Mortar is a factory prepared blend of carefully selected raw materials and graded aggregates, designed to be mixed with LATICRETE 3701 Mortar Admix, which provided a latex mortar bed with high strength and resistance to thermal and physical shock for the Olympic pools at the Water Cube.

The next step was to apply LATICRETE 9235 Waterproofing over the mortar bed to protect against water penetration or leaks, while providing peace of mind as a component of the LATICRETE System Warranty.

For the next step, CSEEC utilized LATICRETE 4237 Latex Additive. As the first product ever developed by LATICRETE founder and Chairman Emeritus, Dr. Henry M. Rothberg, in 1956, LATICRETE 4237 Latex Additive paved the way for the thin-bed method of installing tile and stone on a global scale. LATICRETE 4237 Latex Additive is just as effective

today as it was over 50 years ago. LATICRETE 4237 Latex Additive is designed to be mixed with LATICRETE 211 Powder, creating a tenacious bond for the ceramic tiles installed on the bottom of each pool, as well as on all the pool walls and the decks surrounding the pools.

The joints between tiles were filled using LATICRETE 1500 Sanded Grout mixed with LATICRETE 1776 Grout Enhancer. The tiles were set with 10 mm grout joints, and the combination of LATICRETE 1500 Sanded Grout with LATICRETE 1776 Grout Enhancer provided a dense, durable grout joint resistant to cracking and shading when cured.

“LATICRETE provided complete technical support for the project,” said Ms. Chen Lei. “LATICRETE submitted a detailed application specification before the installation, provided on-site training for the workers, and during the application period provided on-site technical supervision to help solve problems right the first time. This ensured the smooth completion of the pool installation at the Water Cube.”

The Beijing National Aquatics Centre was completed on schedule after four years of construction, and donated to the people of China in a ceremony on January 28, 2008. This summer, beginning on August 8 and ending on August 24, the Water Cube will produce 42 of the 302 Gold Medals that will hang from the necks of athletes from all over the world.

The Games of the XXIX Olympiad promise to be one of the most exciting in history, and Beijing and the people of China are finally ready to share the Olympic spirit that has captivated the city since they were awarded the Games back in 2002.

LATICRETE has already received its Gold Medal, surpassing the competition with world-class tile and stone installation products, technical service, and the commitment of its China team in realizing the Water Cube.

Now and in the future, LATICRETE has also proven its commitment to China, simultaneously building and opening its first wholly-owned manufacturing, R&D and technical center in China during the construction of the Water Cube. LATICRETE (Shanghai) Building Material Co. LTD, the new state-of-the-art facility in Songjiang, Shanghai, will serve to meet the growing demand for LATICRETE System materials in Greater China.

