

DIGITAL WATER PAVILION

Zaragoza, June 3rd, 2008



CARLORATTIASSOCIATI – WALTER NICOLINO & CARLO RATTI WITH THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)

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TIME Magazine “Best Inventions of the year - Architecture (2007)”

AN INNOVATIVE PAVILION FOR THE CITY OF ZARAGOZA HAS BEEN DESIGNED BY ITALIAN ARCHITECTS AT THE MAIN ENTRANCE OF THE EXPO 2008. IT IS AN INTERACTIVE BUILDING, FLUID AND SENSORY. INSTEAD OF TRADITIONAL WALLS, IT FEATURES CURTAINS MADE OF “DIGITAL WATER.”

EXPO 2008 “WATER AND SUSTAINABLE DEVELOPMENT” – ZARAGOZA, SPAIN

OPENING: 12 JUNE 2008, 11.00 PM

Imagine reinventing the city ... Imagine creating an innovative urban platform ... Imagine applying digital technologies to a city, its buildings, entertainment centers, parks and infrastructure. And now imagine arriving in Zaragoza, walk along the “Paseo dell’Agua” and arrive at the Expo, only to find yourself in front of a flat building, the roof on the ground, and above a thin layer of water. You’re curious, you approach cautiously. And something starts to take shape... the roof rises, while lateral water curtains begin falling towards the ground and the walls are shaped. Inside, you find yourself in a three-dimensional, interactive and fluid space.

There you are, in front of the Pavilion of the City of Zaragoza, showcase of the city to come. It’s the Digital Water Pavilion, designed by Italian Architects carlorattiassociati – walter nicolino & carlo ratti with the Massachusetts Institute of Technology (MIT) in Boston.

“Imagine a building completely made of water” explains Carlo Ratti, Professor at the Massachusetts Institute of Technology (MIT) and founder of the architecture office carlorattiassociati – walter nicolino and carlo ratti. “It features liquid curtains for walls - curtains that not only can be programmed to display images or messages but can also sense an approaching object and automatically part to let it through. The technology is similar to that of an inkjet printer on a large scale, which controls droplets of falling water. The desired effect is exactly like a curtain of falling water with gasps at specific points – a pattern of pixels created from air and water instead of illuminated points on a screen. The entire surface becomes like a digital display continuously scrolling downwards”.

More than a traditional building, the Digital Water Pavilion should be considered a machine. It contains more than three thousand digitally-operated solenoid valves, twelve hydraulic pistons, several dozen oil and water pumps, a camera-operated control system, a good deal of controlling software, and many other components. It doesn’t come as a surprise that the city and the organizers of Zaragoza Expo 2008 have decided to entrust its construction not to a conventional civil engineering firm, but to Siemens, one of the leading engineering control companies in the world.

The valves that compose the structure can be opened and closed at high frequency via computerized controls. This produces a curtain of falling water with gaps at specific points. A sensory building



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then, but not only. It is a responsive curtain that can change appearance, display text, images and patterns as it becomes a dynamic and multimedia architecture for all intents and purposes.

Not only the walls. The Digital Water Pavilion reminds us of a theater machine. Thought as a moveable structure, the roof – also covered by thin layer of water – is supported by hydraulic pistons so as to move up and down based on both atmospheric conditions and entertainment needs.

The Digital Water Pavilion, a showcase of the “Milla Digital – Digital Mile”, the next major urban development project of the city of Zaragoza, *“it is not a project meant to seduce the visitor by the sheer power of its architectural form – explains Antoine Picon, Professor at Harvard University Graduate School of Design. Its geometry could hardly be simpler: a rectangular shape in which two boxes are respectively devoted to an information point and a tourist center. The water walls play on an array of feelings. At the same time, the presence of water is related to another dimension of digital culture: the strong emphasis on the sensory, beyond the usual privilege given to vision”.* These are all features that make the Digital Water Pavilion a digital and dynamic building, like the sensors that can feel the presence of people allowing waves and other distortions to be generated.

Expos have always been ideal venues to promote innovation in architecture. Several iconic buildings were previewed at International Exhibitions – from London’s Crystal Palace (1851) to Barcelona’s Pavilion by Mies van der Rohe (1929). More recently, the pavilion designed by MVRDV at Hannover Expo 2000. The Digital Water Pavilion would like to stand as a manifesto for digital, responsive, architecture: *“How to make really fluid, reconfigurable architecture? Our building aims to stand as a possible answer to that endeavor. Fluid in the literal sense of the word. But also fluid as a reconfigurable, responsive building”* comment Walter Nicolino and Carlo Ratti. The interior space of the Pavilion, for instance, can expand and shrink based on necessity and use.

The Digital Water Pavilion is set to make headline news. It will thrill and surprise the millions of tourists from all over the globe expected to visit Zaragoza Expo 2008. Most of all, it is designated to change the architectural world, opening up new and real possibilities. *“In the Nineties – says Carlo Ratti – digital technology led us to fantasize about distant virtual worlds. The dream of digital architecture has always been to create buildings that are responsive and reconfigurable. It is not easy to achieve such effects when dealing with concrete, bricks and mortar. But it becomes possible with digitally-controlled water - a real dynamic and fluid element, which can appear and disappear. The future of architecture might really deal with digitally augmented environments, where bits and atoms seamlessly merge”.*

The Digital Water Pavilion is placed at the entrance of the Expo 2008 in Zaragoza, in front of a newly designed bridge by Zaha Hadid. From its upper level terrace one can gain breathtaking views of the Expo site. And when the Expo lights will come to an end, the Digital Water Pavilion will become a resting place for those visitors who will arrive in Zaragoza with the high-speed train. Inside the building, the info point will remain, and the Pavilion will become a showcase of the “Milla Digital” project for the city’s inhabitants and tourists. And when at night you will come back from the Expo site, cross the Ebro river and walk along the Paseo dell’Agua, imagine the water curtains slowly reduced, until they have vanished from your sight. The roof moves down until it reaches the ground, and all three-dimensional space disappears. The light turns off and the machine is powered down.

The architectural design of the Digital Water Pavilion was carried out by architects carlorattiasociati – walter nicolino & carlo ratti (with Matteo Lai and Claudio Bonicco) in Turin, Italy. A team of researchers at the MIT, led by William J. Mitchell, developed the interactive water wall concept. The design team also includes engineers Arup (London), landscape architects Agence Ter (Paris), and graphic designers FM Studio (Milan). The Pavilion was built by Siemens (Madrid).

A monograph on the Digital Water Pavilion is going to be published by Electa/Mondadori. It contains, among others, critical essays by professors William J. Mitchell (MIT), Antoine Picon (Harvard University), Carlos Merino



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(Arup), Carlo Ratti and Matteo Lai (carlorattiassociati). The Digital Water Pavilion was short-listed for the *Bienal Internacional de Arte Contemporáneo de Sevilla 2008* and *Rizoma – Biennial of Young Architects 2008*.

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