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TOP STARCHITECTS

2011

URBAN A&O

WHERE ARCHITECTURE IS ACADEMIC

SHENZHEN
PINGHU TOWN

URBAN A&O NYC INC. WHERE ARCHITECTURE IS ACADEMIC

BY LORI SOKOL

As an Associate Professor of Architecture at Harvard's Graduate School of Design for the past ten years, Joe MacDonald, founding principal of URBAN A&O, creates designs unlike anything seen before. By regularly incorporating his academic research into practice at the scales of building, landscape, and master planning, it is not surprising that his firm's work is being showcased all over the world. "We set the bar very high," Joe says.

Urban A&O is, in fact, one of a handful of architecture and design firms that operates within the sophisticated computer design environment of parametric modeling. The firm employs the powerful tools of CATIA-based software and digital fabrication processes to produce sculptural and geometrically complex forms and environments. The resulting innovative work tests the limits of material and space through the development of radically new spatial geometries with strong conceptual underpinnings.

"I established Urban A&O as a multidisciplinary urban design practice in 2002," Joe says. "This multidisciplinary approach regularly results in a diverse group of designers, artists, urban planners and technologists engaged in collaborative practice."

The firm's work is concept driven, and thereby finds its formal expression in a variety of ways. And this mission is no better illustrated than in the following innovative projects the firm has recently undertaken.

THE BONE WALL

The Bone Wall, located at the Storefront for Art and Architecture in New York City, demonstrates through geometry, structure, materiality and spatial configuration that pattern is in fact multi-dimensional, intrinsic, programmatic and capable of occupying complex spatial geometries and substantially deep space. The ambition of this project was to explore continuity of surface and modulation of light within the wall, in addition to providing programmatic elements including storage and seating. "This project put Urban A&O on the map," Joe says.

The design of The Bone Wall began with parametric modeling of a base "cell", or rather, ½-cell, which was then inverted and rotated to combine into a complete cellular unit. The base cell has six triangular "horns", 3 up and 3 down, a total of 18 corners, or "control points". Through iterative manipulations of these control points along the wall's organizing horizontal "splines" as configured in CATIA, the body of the wall and its cellular web-like structure stretches and undulates. Any change made to the geometry of the splines regenerates the shape of each cell, demonstrating both non-linear and reciprocal relationships between software and designer that is intrinsic to parametric, or parameter-based, modeling.

THE WATER PLANET

The center attraction of the Steinhart Aquarium at the California Academy of Sciences in San Francisco is the Water Planet, a 6,000 square foot exhibition area. Designed in collaboration with New York exhibition design firm Thinc Design, the exhibit incorporates new modes of design and technology. The Water Planet is the core of an aquarium that explores the diversity of life on earth and the varied habitats it creates. The exhibition focuses on water and the way life adapts to water's many different conditions and states – extremes of abundance and scarcity; stillness and movement; salinity and freshness; heat

THE WATER PLANET

and cold. It gives visitors an opportunity to learn about and contemplate the relationship between water and life—a relationship that most people take for granted. “”This project provided our firm with the opportunity to explore immersive environments using parametric design,” Joe says. “It was an enormously technically complicated project, illustrating the relationship between water and life, and we are proud of the result.”

The Water Planet firmly establishes new visual, conceptual and creative benchmarks for aquarium design. It offers visitors opportunities to touch water in its many states—as mist, steam, flowing and frozen—and the exhibition’s forms and surfaces embody the tactility and sensuality of water. The exhibition integrates living animals and powerful multimedia in order to bring complex natural phenomena within the grasp of young visitors and families. This expanded opportunity for learning about life and the environment is exactly what the Academy—an internationally-recognized research institution whose public face combines an aquarium, natural history museum and planetarium under one roof—wanted to provide.

METROPOLIS BOOTH

This New York-based project merges contemporary digital practice with an ecological ambition, demonstrating that the two are powerfully commensurate. The METROPOLIS booth for ICFF, 2007 is a living showcase of form, function and sustainability.

Urban A&O’s mission with this proposal was to render evident emergent, ecologically progressive materials and methods in a unique and imaginative display, through a wide array of technological advances. The goal of their collaboration was to take on this global social imperative—in earnest, and in style. This was accomplished through a light-weight monolithic skeletal structure of the METROPOLIS booth, framed in an egg-crate assembly of interlocking water-jet cut recycled/recyclable white plastic fins. Unlike recent projects that employ similar CNC technology and interlocking grids, no two cells are the same. Instead, cell size and shape is dependant on location and function. A new 100% recycled white polyethylene sheet material that is replacing PVC in green buildings (UHMWPE) was cut by water-jet to create a series of thin and flexible curving fins, that when assembled, produce the rigid single-body chassis of the METROPOLIS booth.

The METROPOLIS booth exterior’s “living carpet” of brilliantly colored vegetation invites visitors to enter under a massive arc of flowering plants and wild grasses into a comfortable conversation zone lined with METROPOLIS magazines and related materials. The space accommodates several people seated in groups of two or three along an undulating bench padded in recycled cotton denim insulation by Ultra-Touch Natural Cotton Fiber. The same light blue recycled denim in a raw, loose format fills the cellular floor pattern, topped with an Ecoresin™ walking surface by 3form®. Overhead, pockets holding hundreds of METROPOLIS magazines are within reach. Display space for the “Next Generation® Design Competition” projects is positioned just over the back of the bench. The METROPOLIS magazine “wave” interior culminates in a giant LED lamp, a flowering bulb form that will illuminate the entire space.

NATIONAAL ARCHIEF

New Amsterdam: The Island at the Center of the World, located in New York’s South Street Seaport Museum, presents historical Dutch artifacts, personal stories, and contemporary traces of Dutch heritage that are still visible in New York today. Four galleries in the South Street Seaport Museum exhibit historical maps, books, and key documents which are displayed in a horizontal format. Portrait Stations allow visitors to sit and listen to stories of early Dutch immigrants and their diverse backgrounds while viewing portraits of contemporary Dutch New Yorkers. The content is categorized into three themes; The World - what the world was like at the time the Dutch were exploring Manhattan, The Island – focusing on the history of New Amsterdam and New Netherland, and The Origins – describing the various groups of people living in New Amsterdam and New Netherland.

Architecturally, the exhibit incorporates the fabrication of acrylic tables arranged to serve three functions: to form a dynamic relationship with the four existing gallery spaces, to serve as an organizational device for the exhibit content, and to define the visitor experience and circulation. The horizontal acrylic panels fold and bend to climb gallery walls and dive into the gallery floors, creating an ethereal film that runs throughout the galleries and functions as a surface onto which the historical maps and books are displayed. An abstract pattern referencing the cartographic characteristics of the exhibit content is etched into the acrylic panels and establishes a homogeneous space. The use of contemporary materials and digital fabrication techniques create a vibrant contrast with the existing historic architecture of the museum.

METROPOLIS BOOTH

GE HEALTHYMAGINATION SHOWCASE

Conceived as a “gravity-free space of creative imagination,” the GE Healthymagination Showcase in New York City was developed into an experience organized around three “pods” and a central gathering space. Urban A&O, Thinc Design and Local

NATIONAAL ARCHIEF

GE HEALTHYMAGINATION SHOWCASE

Projects partnered to design and produce the event. Urban A&O developed the sinuous, organic overhead pod structures and their corresponding ramped floors in CATIA, which allowed them to rapidly generate the extremely complex, flowing forms that became the signature of the project. The overhead structures were developed as three-dimensional reticulated surfaces: networks of division, marking and construction that form a network of lines and surfaces inspired by the intricate structures of the human body. What begins as two-dimensional patterning is drawn into three dimensions, generating suspended forms comprised of sinuously-shaped, volumetric ribs with curvilinear voids between them. The GE Healthymagination Showcase debuted GE's encompassing health care initiative for its major customers and constituents. Occupying a prominent storefront location at 44th Street and Fifth Avenue, it offered a range or programming to physicians, hospital administrators, stock analysts, press, GE staff, government officials and the general public.

JOHNSON & JOHNSON OLYMPIC PAVILION

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Going from The Bone Wall to the Olympics in just three years, Urban A&O designed the Johnson & Johnson Pavilion at the Beijing Olympics by providing the ground plane for a sequential and contiguous exhibition experience. The Pavilion is enclosed with white fritted glass that is patterned with a varied density of opaque white abstractions of large-scaled bamboo leaves. This variably applied pattern serves two functions: its application is dense where low light levels are required by the exhibition program inside; and the pattern offers a soft, white-on-white building presence when seen from outside through the green bamboo planting of the gardens. Layered behind and in front of the faceted plan of the façade are opportunities to plant living bamboo on the elevations, wrapping the building in a vertical garden that connects the Water Garden below to the Cloud Garden above on the roof. In plan, the glass walls of the Pavilion gently fracture and overlap, allowing bamboo planted on the plinth to traverse into the Pavilion at several locations. This inside-outside planting strategy serves to dematerialize the curtain wall and contributes to a realization that the building envelope is literally alive.

Located prominently on the main Olympic Green, the first encounter with the project for visitors is the Water Garden, a cool, lush, bamboo filled oasis of steeply sloping topographic features that contrast sharply with the typically flat sites of the Olympic Green landscape. Interlocking hills define the entry path and they are heavily planted with several varieties of bamboo and wild grasses brought north to Beijing from the warm southern province of Anji. Bamboo is the dominant plant material for the project and it can be found throughout the Pavilion and landscape, generating a micro-climate in and around the Pavilion site. Cooling effects are provided by mist and fog located throughout the landscape, further contributing to the sense of a lush, green oasis. Custom cast white pavers and white crushed gravel provide reflective surfaces that further reduce the Water

Garden's ambient temperature. A lily pond makes its way into a central void inside the Pavilion where the River Garden is located, with white lilies, grasses and a variety of tall bamboo planted deep within the building envelope.

SHENZHEN PINGHU TOWN

For this mixed-Use project located in the Pinghu area of Loggan District in the City of Shenzhen, P. R. China, Urban A&O is designing an extraordinary example of urbanism for Shenzhen as well as one for a global stage, demonstrating its collective desire to showcase the latest sustainable technology and best practices found anywhere when it comes to building an important family lifestyle center such as the new Pinghu Town Mixed-Use Project.

The firm's goal is to achieve their client's mission by producing a tremendously successful example of a mixed-use project for other redevelopment projects in the Pinghu area. This success will rely upon the firm's innovative designs for the Project's public spaces, creating a lifestyle destination of the highest caliber and quality unsurpassed in the entire region. Together with its consultants in collaboration, Urban A&O will employ public interactive water features, superior retail strategies, a network of beautiful tree-lined shady pedestrian promenades, taking advantage of the remarkable views both within the site boundaries and beyond to neighborhood vistas. These views will be offered both at the street level as well as from the apartments above. Joe says that his firm "will approach our planning principles employing landscape urbanism strategies, strategically incorporating views to Songziling Park into the project, creating a park like setting within which both residential and commercial uses will coexist and function simultaneously, along with historic structures and recreational facilities, all within a cohesive sustainable green landscape and water feature organization." "Together this combination," Joe continues, "we will create a remarkable destination unto itself, as well as connecting it seamlessly within the larger urban fabric of the surrounding environment."

GOAL AS PRACTITIONER

"Contemporary practice is a collaborative one," Joe says, "and I have benefitted substantially from a number of recent collaborative associations, which I believe this kind of practice extends beyond traditional project requirements and is indicative of a new generation of multidisciplinary practitioners deeply committed to research, discovery, and ingenuity."

Joe's goal as a practitioner is seeking out imaginative intersections between art, science, architecture, cities, and technology in an effort to communicate emerging developments within each of these fields to the widest possible audiences. His firm's work has therefore focused on several fronts simultaneously, from theoretical design idea collaborations, competitions, and art installations, to architectural, landscape, and master planning projects at an urban scale. ■

AWARDS

2010 Exhibition on Design and Graphic Design Shortlist
For the Center for Architecture AIANY's "Not Business as Usual" (NBAU) initiative.

2009 China's Most Successful Design Award
For the Johnson & Johnson Olympic Games Pavilion, Beijing PRChina.

2009 Good Design Award
For the Steinhart Aquarium, California Academy of Sciences in the Environments category.

2009 Event Design Awards
For the Steinhart Aquarium, California Academy of Sciences and the Johnson & Johnson Olympic Games Pavilion, Beijing, in the Best Museum Environment and Best Outdoor Consumer Event Exhibit/Environment categories.

Archi-tech AV Awards
Grand Prize Award for the Steinhart Aquarium, California Academy of Sciences.

Silver IDEA Award Recipient, 2009 International Design Excellence Awards
For the Steinhart Aquarium, California Academy of Sciences in the Environments category.

New Practices New York / 2008 Highest Honor Recipient, AIA New York Chapter
Juried portfolio competition on to recognize and promote new, innovative and emerging architecture firms in NYC.

2008 Design Vanguard 2008 Architectural Record
Selected as one of top ten emerging firms from around the world, December, 2008, pp. 80-83.

2005 Dean's Annual Research Grant, Harvard Graduate School of Design
Minimal Surfaces: Implicit Trigonometric Surface Patterns: A Proposal to Fabricate Series of Architectural Wall and Screen Prototypes.

2004 Dean's Annual Research Grant, Harvard Graduate School of Design
On Pattern: its permutational, performative potential in the parametric formation of architecture.

2002 Dean's Annual Research Grant, Harvard Graduate School of Design
Digital Cartographies for Tokyo.

2000 Robert S. Brown '52 Faculty Traveling Fellowship, Rensselaer Polytechnic Institute.
Reclaimed Territories and Reciprocal Manifestations: Beijing, Hong Kong, Shanghai, and Taipei.