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INDIAN ARCHITECT AND BUILDER

INNOVATE

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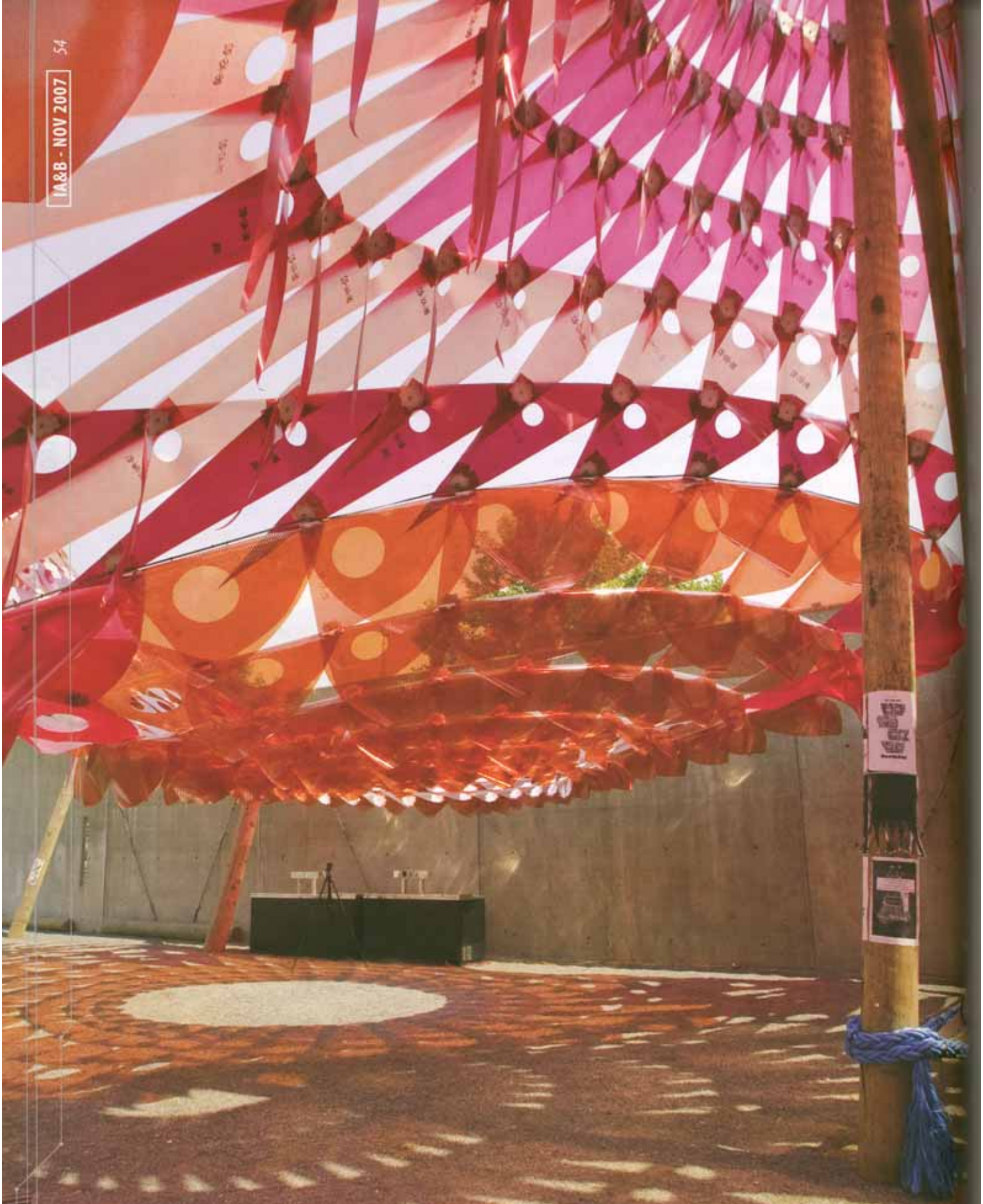
Focus: Digital Design

Jasubha MEDIA



1. Liquid sky marries digital design and fabrication with craft techniques.
© Mark Lentz.

DIGITAL CRAFT

The work of Ball-Nogues reworks the digital to evolve a contemporary take on craft practices.

Text: Namita Dharia

The term digital design is stereotypically associated with smooth polished surfaces and highly finished forms. The work of Ball-Nogues, a firm of young architects from the Los Angeles area, rebels against this formulaic way of viewing the digital; using their work to critique the digital. The three projects featured in this article are temporary installation works commissioned by various parties. The Liquid Sky project is the 2007 PS1 project for the Museum of Modern Art, N.Y., the Rip Curl Canyon is a 2006 installation for the Rice Gallery, L.A. in collaboration with The Museum of Fine Arts, Houston; and the Tiffany & Co project was designed for Frank Gehry's jewellery launch gala in L.A. in 2006. The three form examples of how basic construction methods married with digital design produces work that unites the strong materiality and fabrication of craft techniques with the fluidity and freedom of the digital. This article explores the method in which the three projects critique the digital in terms of project typologies, construction methods, and experientiality.

The Liquid Sky project consists of two courtyards that host a series of concerts over the summer for the Museum of Modern Art, New York. The project comprises a number of pavilions and a catenary canopy. Both are created from translucent Mylar petals that generate a kaleidoscopic atmosphere underneath. Support towers constructed from untreated utility-poles break the complexity of the digital Mylar surface, contrasting high-tech and low-tech methods of construction. Both the Rip Curl Canyon and the Tiffany & Co project form earlier versions of this experimental digital-craft construction technique. The Rip Curl Canyon is an elaborate interior installation mimicking a canyon. The architects describe this formation as emerging from the rear of the gallery, its steep, crevices sloping and cascading down to break apart in ribbons of curling waves, towards the front facade. This creates a variety of spaces: ridges, alleys, corners, nooks, and platforms for people to nest in. The project traces its lineage to the Tiffany & Co project where, in the architects words, "a wall structure, half a block long and curved like the human body, was constructed from 4000 strips of cardboard sandwiched together. Twenty-four ottomans of similar construction, no two alike were distributed across space, inviting the 600 guests to explore alternative ways of sitting."

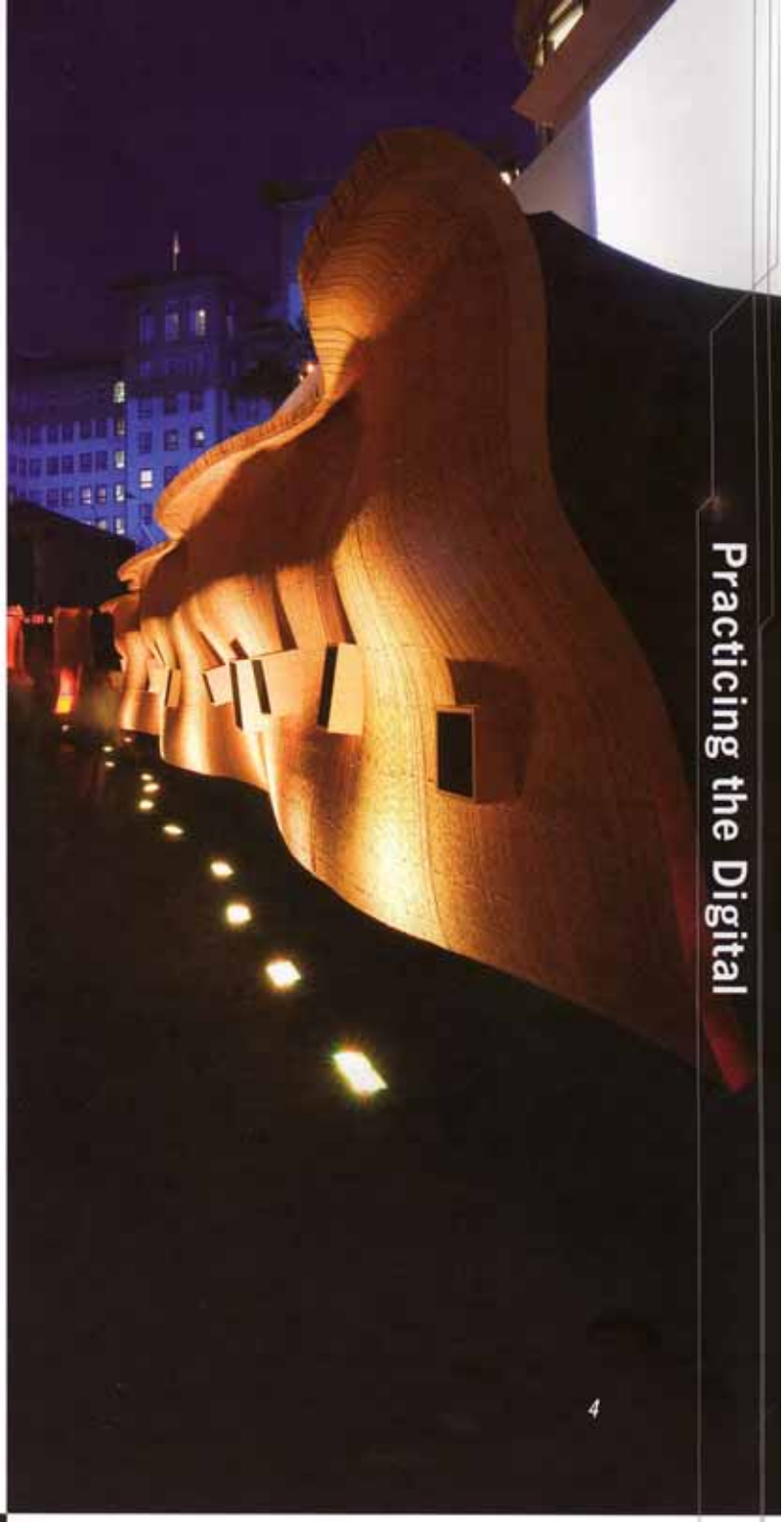
All the projects fall under the umbrella of installation projects: architecture based on a largely temporal scale. The interiority and the ethereality of the architecture allude to the digital in its ability to fluctuate and transform. Therefore, the principles of digital design are embedded in the nature of work itself. At the same time all three projects are vested in ideas of tactility, sensuality, materiality, and craftsmanship, creating a hybrid architecture of the digital and land material. The nature of the projects also allows the team to juxtapose them with fields such as art and product design. The interdisciplinarity thus formed enables the crafting of a new digital design methodology.

Each project juxtaposes digital fabrication techniques with cost-effective construction methods. Liquid Sky combines latest cutting and fabrication techniques, gleaned from the sailing industry, to create the Mylar panels, while the hammocks and tripod superstructure are built with low-tech assembly. The architects explain that to construct the elaborate pavilion structure, engineers used Arup's Oasys software to form anticlastic surfaces. These surfaces were then instantiated with 'petals', i.e. broken into individual facets, using custom written scripts in parametric modeling software – Bentley Systems Generative Components and the Digital

Project version of Catia. The lengths of individual petals were governed by the use of an algorithm that factored in the elevation of the petal from the ground and its distance from the center of each tent. The installation process was scripted in order to expedite it. This allowed for students from the Stevens Institute of Technology to install the project in about two hours, where the polyester reinforced Mylar petals were automatically cut out and labelled directly from digital files using a computer controlled cutting machine. This elaborate fabrication was contrasted by the use of untreated poles to support the canopy, the crudely tied net hammocks and the droopscape canopy, all built in reference to everyday solutions.

This contrast is also seen in the Rip Curl Canyon and Tiffany & Co projects where the fabrication processes evolve from Gehry 's 1970's 'Easy Edges' line of furniture. According to the architects, the construction process for both projects consisted of laminating over 20,000 strips (weighing approximately eight tons) of curved, industrially die-cut corrugated cardboard. The cardboard laminates acted as semi-monocoques with an intermediary plywood armature. The armature was made of standard wood materials – 2x4s and plywood – individually cut and CNC routered offsite to conform to the varying dimensions and curvature of the undulating cardboard shells. Together these formed a system that was capable of supporting the weight of several people. This particular technique also enabled the architects to introduce double curvature. Full-scaled mock-ups and a parametric digital interface were jointly used to shape the cardboard 'ribbons'. A digital language of slotting connections was developed so that the non-standard parts came together like a giant puzzle in four days. This required very little structural decision-making in the field and gave the architects the freedom to make improvised choices when installing the pieces.

In addition to the fabrication techniques, the experientiality of the three projects also deconstructs the idea of a digital experience. Although fabricated by sophisticated digital techniques, the projects rebel against the idea of the stereotypical digital architectural where



2. The Liquid Sky project is the latest in MOMA's PS1 installations. © Steph Goralnick.
3. The Rip Curl Canyon invokes the American landscape in the Rice Gallery. © Nash Baker.
4. The Tiffany & Co project creates a hedonistic atmosphere to match Gehry's new line of jewellery. © Joshua White.

experience. The Liquid Sky project alludes to a carnivalesque experience that was made possible by the materiality and sensory experience of the structure. The project induces the sensual quality of digitally produced architecture at the same time contrasting it with the basality of the carnivalesque experience. The rose tinted Mylar panels create a hedonistic atmosphere that is enhanced by the relaxed quality of the netted seating hammocks. Creative endeavors such as the enormous community hammocks made of brightly coloured netting, the droopscape canopy that sways with the wind and the drench towers that periodically soak visitors with their gravity-induced tip buckets, generate an exuberant atmosphere, reminiscent of beach shacks and country fairs.

The Rip Curl Canyon and Tiffany & Co projects on the other hand tie the digital experience to a very different materiality. Nature and landscape inspire a mythical surface that is half ephemeral and half material. Rip Curl Canyon references a mythical location in the American West

and water collide. The project works on concepts of vastness and barrenness alluding to the great American landscape. The idea of creating rock with corrugated cardboard contrasts a temporal manmade architecture with an everlasting, natural one. The materiality of the sensual forms constructed using the natural texture of the cardboard, mimic the sedimentary patterns and watermarks on the side of the canyon. The Rip Curl Canyon impurifies digital architecture by allowing people to trespass and violate it, finding their own places within the landscape. Gallery visitors sleep, eat, read, climb onto the terrain, slide across the dunes or romance in the darkened recesses below the cardboard surface. The architects observe that this steady climbing and exploring causes the raw cut cardboard to slowly compress with each footstep, over time this accumulation develops into subtle pathways, similar to the weathering of the natural terrain. The Tiffany & Co project uses similar allusions, evoking the idea of the body as landscape, a body that invites partygoers to be voyeurs. Ball-Nogues describe designing carefully choreographed "peep shows": display windows, inspired by Marcel

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5. Water drop buckets in Liquid Sky add to the carnivalesque atmosphere. © Mark Lentz.
6. Individually designed Ottomans in the Tiffany & Co project encourage new ways of sitting. © Joshua White.
7. The smooth faces and crevices of Rip Curl Canyon propagate multiplicity of uses. © Nash Baker.

Duchamp's Étant donnés, which punctuate the wall. Each window offers tightly framed views of live nude models, wearing nothing but the Gehry jewellery, thus alluding to the living 'body as landscape'. Here again the sanctity of the architecture is deconstructed by its own invitation to violate it: gape into the peepholes, to laze on the ottomans, and caress the surface of the wall.

Ball-Nogues' work certainly puts the fun back into digital design. Each project harnesses digital techniques to produce a theatrical experience full of pauses, exaggerations, and the unexpected. Careful choreography of material, lighting and movement allows for the inversion of normative experience. This is made possible by the unique blend of digital and craft that are an inherent part of the projects' ideology.

As with most installation projects one has to be careful not to allow its temporal existence to take away from the design, to ensure that the gimmick does not consume the project, and finally, to be vigilant that the product is as rich as the process itself. The three projects though very well produced and choreographed could have perhaps benefited from more attention to the above factors.

There is no denying that the digital is revolutionizing architecture. It allows us the flexibility to shift scale, to work on a complexity of form and experience, but at the same time detaches us from a material reality. The criticality in Ball-Nogues' work lies in the tying of this material and sensory perspective back to the digital. In addition, the work evokes a certain childish fun, challenging the digital not to take itself too seriously. The three projects featured here thus demonstrate an interesting lesson: that the digitally created need not conform to its creator and that it is possible to harness the general of the digital, into a particularity of space and experience. ■

FACT FILE

Project: Liquid Sky
Location: P.S.1 Contemporary Art Center, New York
Client: Museum of Modern Art / P.S.1 Contemporary Art Center
Architect: Ball-Nogues Studio, Benjamin Ball and Gaston Nogues partners in charge
Design team: Benjamin Ball, Gaston Nogues, Paul Endres, Mark Pollock, Erik Verboon, Corey Brugger
Structural Engineering: Endres Ware Architects and Engineers: Paul Endres, Benjamin Corotis, Mary Barensfeld
Structural Consultants:
Arup Los Angeles: Bruce Danziger
Arup New York: Matt Jackson, Matt Clark
Werner Sobek: Will Laufs
Parametric modelling and scripting: The Product Architecture Lab at the Stevens Institute of Technology: Mark Pollack, Erik Verboon, Corey Brugger
Project Area: 12,000sqft
Construction: Ball-Nogues Studio and volunteers
Construction Team Leaders: Mark Pollack, Justin Capuco, Jed Geiman, Andrew Lyon
Team: Danny Abalof, Andrea Abramoff, Rocio Barcia, Bogyi Banovich, Bridget Basham, Tripp Bassett, Harrison Blair, Lorka Birn, Lander Burton, Maria Camoratta, Steven Chen, Dianne Chia, Malachi Connely, Ceasar Cotta, Jonathan Cottle, Elizabeth Cunningham, Dino, Susannah Dickinson, Erin Egenberger, Kate Feather, Michael Ferrante, Bruce Foster, Hiroe Fujimoto, Owen Gerst, Lee Gillentine, Adrian Grenier, Yarden Harari, Mark Horne, Steve Keene, Keivon Kianfar, Greg Kay, Da Sul Kim, Nicole Kotsis, Michael Lindsey, Margot List, Catherine Lohanata, Sabrina Lupero, Andrew Lyon, Brittany Macomber, Mia Lai, Miles Mercer, Paul Matys, Cristina Milleur, Scott Mitchell, Ry Morrison, Charon Nogues, Caroline O'Leary, Meaghan Pierce-Delaney, Alex Pollock, Raphael Periera, Cindy Poulton, Ardo Pizzi, Jar Rittoral, Todd Rouhe, Larissa Santoro, Karl Schmid, Benno Schmidt, Jess Shirley, Jesse Seegers, "Skyler", Rico Suarez, David Wicks, CK Dickson Wong, Tom Wu, Coe Will
Volunteer Coordinators: Chris Reins and Elizabeth Lande
Project Estimate: $70,000
Initiation of Project: April 2007
Completion of project: June 2007
Other details: Seating hammocks by Sheila Pepe
Water effects by Fountainhead: Jenna Didier, Oliver Hess, Nick Blake,
Mylar Laminates by Dimension Polyant

Project: Rip Curl Canyon
Commission, Rice University Art Gallery
Location: Rice Gallery, Houston Texas
Architect: Ball-Nogues Studio, Benjamin Ball and Gaston Nogues
Design team: Benjamin Ball, Gaston Nogues, Tom Obed
Structural Engineering: Bruce Danziger, Arup Los Angeles
Project Area: 1760sqft
Construction: Ball-Nogues Studio and student volunteers from Rice University and the University of Houston
Project Estimate: withheld at the client's request
Initiation of Project: December 2005
Completion of project: September 2006
Other details: CNC router services by Brochsteins Incorporated

Project: Tiffany & Company Gehry Jewellery Launch Gala
Location: Rodeo Drive, Beverly Hills California
Client: Tiffany & Company
Event Producer: The Donahue Group
Architect: Ball Nogues Studio, Benjamin Ball and Gaston Nogues
Design team: Benjamin Ball, Gaston Nogues, Sam Gehry
Structural Engineering: Ball Nogues Studio
Project Area: Not Applicable
Construction: Ethos Design
Project Estimate: withheld at the client's request
Initiation of Project: December 2005
Completion of Project: March 2006