

LYCEUM COMPETITION

by Terry Boling

Project by Michael Hatter

Introduction

In January, 2006, I led a small group of students in a studio project for the Lyceum Fellowship, an annual international competition for selected schools of architecture, in which the University of Cincinnati School of Architecture and Interior Design has participated for more than 20 years. The competition, offered as an elective studio, is coveted as an opportunity to vie not only for prestige, but also for a \$10,000 first prize to be used for travel by the winning student. The students were warned prior to studio selection that it would be an intense and rigorous quarter, replete with impossible expectations and exceedingly high standards, and with only a six-week time frame to work on the competition. Even after the scare tactics, I was rewarded with nine of the schools' finest students, ready for anything. A grueling 10 weeks followed, filled with the usual array of setbacks and individual triumphs, and after the dust settled, we were shocked to discover that we had placed in the top 5 positions out of six, collecting a total of \$17,000 in travel grants and stipends.

Strategy

"Old meets new on a site recently opened up to a greenway as a result of the "Big Dig" atop a building in Boston's historic financial district. Construction on the roofs of existing commercial buildings presents a unique set of challenges. These include constructability, privacy, mixed-use design, and economies of scale. The focus of the project is dealing with these constraints creatively, while emphasizing advances in material science construction techniques and energy efficiency."

The program calls for a lightweight, energy-efficient, flexible, urban penthouse that meets the needs of a family of four that includes a professional musician, a venture capitalist and two teenage children."

Program brief from the 2006 Lyceum Fellowship competition

Traditionally, as in any competition, the lyceum studios have placed heavy emphasis on a high level of graphic innovation, which can often become the "raison d'être" of the entire scheme. This attitude has become ever more pervasive in the design studio as students master digital tools with an unprecedented ease [1], yet fail to connect the images with the constructed world. While we felt that it would be necessary to attract the design jury with beautiful images, we would also need to demonstrate a deep and broad understanding of the complex issues of the program, and to synthesize that understanding into meaningful moments of architecture in order to sustain that critical jury attention. The competition brief presented a unique opportunity for us to approach the project not only as an exercise in graphic acuity, but more importantly, as a way to foreground architectural research as a pedagogy. This would require a conscious decision to resist the seduction of entirely internalized and software-driven investigations in favor of inquiries that embraced the realities of phenomena [2]. How could we create a project that was speculative and interrogative yet grounded in the facts of construction?

Research

"The new architecture will not be about style, but rather about substance - about the very methods and processes that underlie making."

Stephen Kieran and James Timberlake,
Refabricating Architecture

The first four weeks of the studio were devoted to "communal research" (historical, theoretical, and technological), while the last six weeks were committed to the design and production of the individual competition entries. The research component of the studio centered on the interrogation of the materials, methods, and systems of construction, focusing specifically on component design,

fabrication, and assembly. The primary texts for the studio were *Surface Architecture*, by David Leatherbarrow and Moshen Mostafavi, and *refabricating Architecture* by Stephen Kieran and James Timberlake. Our task was to critically examine the theories and practices of prefabrication [3] ("mass universalization"), and to contrast them with ideas about specificity and place ("mass customization", "critical regionalism" [4]). We examined the history of pre-fabrication and tried to understand the reasons that it has never become fully integrated into mainstream construction. The students soon became strong advocates for repositioning the architect's role in the production of architecture, specifically regarding the integration of off-site fabrication into contemporary construction practices. Through our readings and discussions, the students also grappled with the relationship between representation and technology. Should architecture relinquish its image to visual reflections of systems of production, or should it simply become scenographic? [5] Would it be possible to posit a new understanding of this relationship by examining building performance as well as appearance?

Following the research period, I took the students to visit the site. We immersed ourselves for two days in the rich and complex fabric of Boston and the surrounding area, soaking up images in our quest for understanding more about the particulars of the place. We also visited the offices of *Empyrean International*, one of the foremost pre-fabricators in the United States, located in Acton, Massachusetts, who were then working on the fabrication of components for the flat-pak house by Charlie Lazor [6]. By speaking directly with their designers and craftsmen, we discovered the practical benefits of pre-fabrication, such as leveraging more control over quality, time, and costs, in addition to minimizing waste.

Design

“How can design utilize the opportunities of current industrial production so that the practice of architectural representation is neither independent of nor subjugated to the domination of technology?”

David Leatherbarrow and Moshen Mostafavi, Surface Architecture

Now that the students were fully engaged with the research questions of the studio, we started to work on the competition. The strategy for the six-week design exercise was simple: Four weeks of development, with a studio pin-up each week, followed by two weeks of design development and final presentation. Since the pedagogic goals of the studio were connected to research, constructability, and craft, one of the primary hurdles to overcome was how to illustrate our response to these topics through the required competition format of six 11" x 17" images. I encouraged them to use physical models to explore tectonics and craft, and to supplement the physical work with drawings as necessary. The students were also asked to craft a clear and articulate written strategy to help the jury understand the goals of the project.

I will utilize the work of graduate student Michael Hatter to demonstrate the uses of various media, including **form•Z**, in the development of his first place project. I should note here that the University of Cincinnati School of Architecture and Interior Design program introduces **form•Z** into the curriculum in the freshman year, teaching basic modeling, animation, and rendering techniques. Sophomore year, the students use the program intensely in form, space, and site explorations in the immersion curriculum [7], followed by an introduction to component modeling and B.I.M. By the time they reach the elective studio offerings in their pre-thesis year, **form•Z** is one of the many tools they have in their arsenal.

Michael started immediately with some quick **form•Z** models that identified his preliminary design, a prefabricated truss structure with a segmented cladding suggesting varying degrees of enclosure (illustration a).

This image, while compelling, lacked a clear strategy. The diaphanous wrappers implied enclosure, yet floated ambiguously outside of the truss structure. This image is typical of the kind of digital work that often fails to advance due to

the “sense of fulfillment” that occurs in the use of representational software [8]. I asked Michael at this point to quickly switch to a physical model, and to investigate the relationship between structure and skin. The new physical model (illustration b) generated significant discussion in regard to this relationship, as well as to the role of fabrication and assembly in the project, and how metaphor can be effectively utilized in the development of details. This iteration moved the thermal enclosure to the interior of the truss,

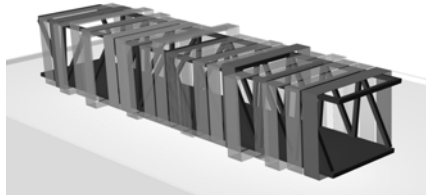


Illustration a

and suspended living spaces below the truss structure with a cable system that recalled the segmented wrapping of the earlier scheme. We were encouraged by the idea of cables wrapping the truss and defining the space below, however, the relationship between the space in the truss and the space below it was unclear. At this juncture, we recognized that the cable system was evocative on many levels, acting as both a privacy screen and as a sunscreen, defining exterior space, and providing a tension structure for the spaces below the truss. We felt that developing the tectonic articulation of the system in conjunction with its performative responsibilities could lend credibility and depth to the scheme. Michael researched a variety of cable assemblies, searching for a poetic tectonic strategy that drew from the program (house for a musician, illustrations c and d), the site (Boston harbor and clipper ships), as well from contemporary construction.

form•Z studies were the quickest and most effective means for exploring the tension cable connections and articulating them as a system (illustrations e and f). The ease of producing simple light effects and shading in **form•Z** contributed significantly to the legibility of the scheme, even at an early stage in the design. **form•Z** was also used to demonstrate the layering of systems and the fabrication sequence in one drawing. (illustration g) What began as quick 3D studies of joints and systems quickly became key elements in the graphic explanation of the project. Michael's final iteration illustrated the concept with a new clarity. The truss structure was wrapped in a tension cable system that supported a thin platform below, allowing for column-free living spaces below the truss, and providing a variable privacy/sun screen on the exterior of the glazed enclosure. (illustration h)

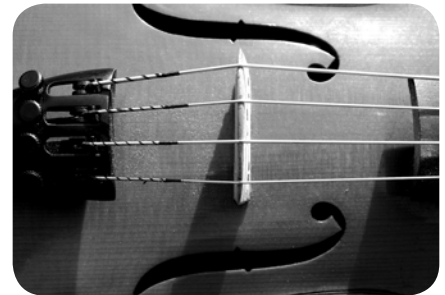


Illustration c



Illustration d

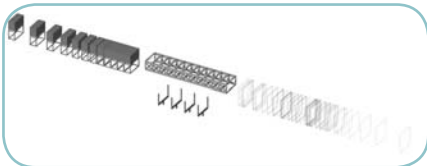
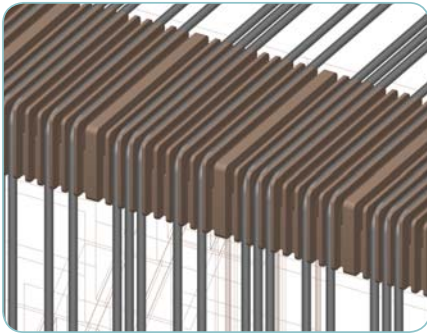
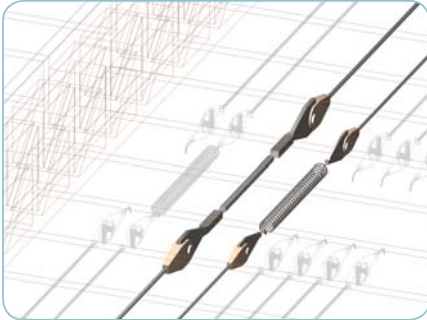


Illustration b

Conclusion

"Housing for Urban reTension seeks to reinforce the momentum of urban redevelopment and civic reconnection facilitated by Boston's Big Dig project. Through site strategy, production technology, and formal imagery the proposed design offers one solution to meeting the unique physical and social challenges presented by residential rooftop housing design.

Supporting the goal of limited site disturbance, the design employs twenty-two 8' x 19' prefabricated, largely pre-finished modules that can be trucked to the site and efficiently craned into place. The modules fit into or are suspended by cables below a glue-lam wood truss. The structural cables that support the living spaces not only carry gravity loads, allowing for an extremely light-weight module assembly, but, as they vary in density across the face of the building, also act as light shading and privacy screening. Borrowing from local imagery and materials, the design strives for a sensitivity to both the old and the new, to



Top to bottom: Illustrations e, f, g

the historic and the modern, as it lends itself to Boston's ongoing effort to reconnect the commercial core with its waterfront roots." (illustration i)

Michael Hatter, final project statement

The studio experience was both invigorating as well as exhausting, and was successful on many levels. Not only did we get the jury to notice the projects, but we did so by resolving the complexities of the program with a rigor and grace that stemmed directly from our research. And while the six-week time frame initially seemed like an obstacle, it became clear that the abbreviated schedule forced each student to commit to a strategy early on, to stay loyal to it, and to develop it as thoroughly as possible through multiple iterations. Finally, the students achieved a confidence that can only come from "being in the trenches". There was an amazing collaborative vibe and camaraderie that was felt throughout the quarter that belied the notion of a competition.

In conclusion, I would like to acknowledge all of the students who participated in this studio: Their commitment and unbridled enthusiasm created the rich working environment that made this project so satisfying. They are: Michael Hatter (First Place), Ryan Newman (Second Place), Dawid Pol (Third Place), Tony Schonhardt (Citation), Magda Wala (Merit Award), Chris Davis, Sarah Krivanka, Priya Arora, and Kunal Dhavale.



Illustration i



Illustration h

References

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