University of Massachusetts Amherst

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April, 2013

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Introduction

Understanding the intertwined relationships that constitute a "place" involves studying that place at a series of scales. This paper focuses on work completed during the Fall 2011 third semester undergraduate studio at the University of Massachusetts that employed *making* at a variety of scales to engage students in a close study of their local environment.

One pedagogical goal of the third architectural studio is to move students from formal abstraction toward the expressive potential of actual architectural construction. This semester acts as a bridge between the more focused projects of first year studios and the independent projects of the final three semesters of UMass Amherst's 4+2 program. In the studio featured in this paper, students progressively moved away from abstraction, starting with projects that foreground materials and advancing toward projects that contend with site in increasing specificity. In doing so, the studio explored how scale-jumping - from building to detail, from object to body, and from region to site - can deepen our understanding of place.

In contrast with studios that begin with tactile exercises and lead up to full building designs, this studio's culminating projects were design proposals for intimately-scaled, site-specific installations. However, since the installations themselves would not be built during the studio, we sought specific ways to impart architectural lessons during the arc of the semester. We first studied architectural details from contemporary built work to ground the studio exercises in a constructional logic. Next, to understand bodily relationships to space, material, and craft, students then crafted full-scale cardboard constructions. Subsequently, to root their work in a regional context, students researched responses to post-industrial riverine city issues including planning, ecology, transportation, art and culture, and proposed their own systemic responses to our region. Finally, students applied these lessons to designs of site-specific installations that sought to intensify a bodily engagement with place.

Articulated Buildings Study

Students began the semester with architectural precedent studies that demonstrated a strong tectonic agenda. They engaged primary documentation from the book "Details in Contemporary Architecture" by Christine Killory and Rene Davids, and conducted additional research on individual projects. Killory and Davids' book provides documentation to reveal "what actually lies behind the physical making of architecture - its structure, material and form," in contrast to more superficial visualizations of architecture. For Killory and Davids, "architecture is developed slowly, laboriously, through a continuing process of working back and forth from concept to detail, with increasing specificity and precision."¹

To ground their own studies, students enlarged and represented the details in the book, seeking to understand the "rules" and language of the selected work. For each project, they referenced both photographs and construction drawings to analyze how the design communicates essential architectural aspects such as gravity, assembly, and materiality. (Fig. 1) To begin, they asked whether the project demonstrates or masks the resolution of weight. They developed positions on whether the project articulates how it carries weight or whether it strives to dematerialize. Students also sought to understand the hierarchy of materials and connections, whether they be expressed or concealed, articulated or abstract. They examined whether the design worked to a module such as a structural system, or to dimension based on materials, ergonomics, or site measurements. Perhaps most critically, they investigated whether the details sought to establish scale or deny it.²



Fig. 1. Starlight Theater Study - Grant Rocco and Evan Ralph

Student teams conducted their analyses at various scales of site, building, and detail, and they sought both connections and disconnections between these scales. For example, a team investigating the South Mountain Community College Performing Arts Center in Phoenix by Jones Architects connected detail articulation to site criteria. They noted how the colors and materiality of the horizontal rusted steel strips on the building's façade amplify the colors and texture of the surrounding desert setting. They also recognized that the irregular distribution of the strips ties performance to program by shading interior elements appropriately in the desert climate.

Similarly, students examining the Art Center College of Design in Pasadena, CA by Daly Genik Architects were deeply impressed by the resolution of challenging design criteria - adding skylights to a fragile roof structure without additional load, which was a feat only made possible by the adoption of ETFE pillows for skylights. This critical selection of material to resolve an architectural problem influenced many students as they moved into the studio's next phase: creating full-scale constructions.

Tectonic Wedges

The cardboard chair has inspired the practice of both architects and industrial designers, notably when Frank Gehry introduced the Wiggle Chair in 1972. Similarly, architectural curriucula have incorporated cardboard experimentation such as the Chair Affair competition, which was administered jointly by the AIAS and the International Corrugated Packaging Foundation. As noted in the competition brief, working with cardboard at a small scale encourages exploration of the relationship among material and structural systems, aesthetics, ergonomics, modularity, and joinery. (Fig. 2)

In our studio's Tectonic Wedges project, pairs of full-scale cardboard students created constructions that would carry their weight, engage their bodies, and respond to their adjacent neighbors' design decisions. The project shared important objectives with traditional cardboard chair projects in that the material parameters of cardboard both limited and deepened design possibilities. By building at full-scale, in an envelope of 28" to 37" wide and 30" deep, students quickly experienced the interplay of intention, realization, and

interpretation. Students recognized that even this modest construction provided an immediate feedback loop that yielded rich results for understanding design development, and enhancing their time management and collaboration skills.



Fig. 2. Tectonic Wedge - Ian Wright and Daniel Moseley

The Tectonic Wedges project also departed from traditional cardboard chair projects by drawing on students' analyses of contemporary buildings, thus directly engaging with the strain of architectural discourse that explores the poetics of construction. They examined their contemporary precedent studies for tectonic agendas that they could translate into bodysized constructions.

For instance, one team studying Garafalo Architects' Nothstine Residence took formal inspiration from the folded tectonic plane that delineates the programmatic additions in this renovation project. They scaled the folded plane in their own project to create programmatic moments of bodily engagement including sitting, leaning, and balancing work materials.

Another team studied the kinetic faceted roof panels of Studio Gang's Starlight Theater in Rockford, IL. (Figs. 1 & 3) They approached their cardboard project with the idea that simple geometric modular elements could aggregate to form a more complex construction. They translated the concept of kineticism into responsiveness, so that their knotted assembly could be tightened, loosened, and reconfigured to suit a variety of body types and postures.

By creating an aggregate installation, the Tectonic Wedge required students to engage their local context. Students gleaned insights from negotiations across the social site boundary of the architectural "party wall," aligning key geometries and occasionally creating continuous surfaces. The students assembled their Wedges in small aggregations to test their alignments in episodic studio collaborations.



Fig. 3. Tectonic Wedge - Grant Rocco and Evan Ralph

To respond to their abutting neighbors, students looked to urban projects that successfully navigate such constraints. For example, students examining Archi-tectonics' Greenwich Street Project were impressed with its complex geometries, particularly how the glass folds align with the rhythm of the existing brick warehouse.

The Tectonic Wedge formed an intermediary step to the studio's next project, which was rooted in a real site and a more expansive palette of materials. By limiting the site and material variables, students took their first steps toward fully developed responses. They thus proceeded into the final studio project with an understanding of scale through the bodily making of the Wedges. In addition, they gained a modest understanding of site intervention through their transformation of a public space.

The Riverscaping Competition

The full-scale, constructed Tectonic Wedges project was ideal practice for the semester's culminating project - a brief developed by the international design-build Riverscaping Competition. The competition was part of a larger collaboration with the European Union, particularly the City of Hamburg, which was the winner of the European Green Capital award. This collaboration investigated the relationship between rivers and cities, and it included courses, lectures, community meetings, symposia, and travel exchanges, as well as the design-build competition.³



Fig. 4. Regional Proposal – Katherine Miller

While the Hamburg environs and the Pioneer Valley's UMass Amherst's surroundings differ in many ways, the Riverscaping grant sought to examine their common riverine resource, "the impetus for their creation and important to the everyday life of the present-day cities."⁴

Participating in the Riverscaping Competition brought into sharp relief the "place" in which the students reside; it demanded both a systemic and a tangible response. The Competition asked for proposals at the regional scale of the Connecticut River as well as intimate proposals for construction at one of four individual sites. The studio required students to visit all four of the sites and to identify an additional four thematicallyrelated sites along the river for investigation.

A fortunate alignment of curriculum between the third-year studio and a required junior year writing course sharpened students' powers of observation by approaching the region through writing as well as design work. By examining eight waterfront locations, students who had previously paid scant attention to the river gained a heightened appreciation of the river and its ecology, history, industry, and agriculture. As they viewed the river in new ways, they incorporated this newfound insight into the conceptual basis for their projects.



Fig. 5. Extrapolating Site Patterns – Greg Orwat

Our studio's work at the regional scale paralleled the examples from Hamburg, but also adopted a local lens. The dominant thematic categories included visibility, accessibility, connectivity, materiality, and community history. For one group, accessibility meant developing a comprehensive signage and graphics package directing the public to river access points. (Fig. 4) Another group explored connectivity by linking existing resources to create an intermodal outdoor adventure trail traversing the Pioneer Valley by zip-lining, paddling, and bicycling. Some students explored projects that highlighted the ways in which the river heightens our experience of time, rhythm, and change. (Figs. 5)

In a second phase, students subjected individual design proposals at an intimate scale to critical assessment based on criteria developed in the regional strategies. While the competition brief made four sites available for study, our studio worked solely with the site nearest to campus, which was located in the still heavily agricultural town of Hadley. Although the competition brief was broad, a representative local Site Committee had identified key objectives and generated site-specific design criteria.



Fig. 6. Highlighting Daily Rhythms – Samantha Okolita

The Hadley site sits along a dike that protects historic agricultural lands and the town common. The dike also acts as a popular pedestrian walkway with the Connecticut River on one side and protected historic farms on the other. The Hadley Site Committee's criteria noted the prominence of this site and indicated that the installation should focus on communicating the importance of conservation, protection, and stewardship on and along the river. With the powerful landform of the dike, the linear site, and the rich agricultural history of the area, students were devised a wide range of strategies.

Some projects focused on the visitor's experience: a shelter for observing rain fall, infrastructure that interacts with the movement of the river, a sculptural walkway to mark time through light and shadow, and a pavilion of darkness to heighten the play of light on the water. (Figs. 6, 7) Building on the culture of Hadley as an area rich with agricultural harvests, the students also imagined "harvesting" local

materials from construction sites, ruins, scrap heaps, and agricultural wastes to create materially site-specific works.

Many students found resonance in similarly scaled built works such as "Utopian Prospect" by Mark Robbins and "Body in Repose" by Byron Kuth and Elizabeth Ranieri.⁴ In these examples, students examined projects that explored bodily engagement with site. The competition site, parallel to a public walkway and offering broad views of the River, demanded that student designs mediate this unobstructed view with a more carefully calibrated instrument. Students strove to transform the way visitors experienced the landscape, much as the Riverscaping keynote speaker, Christo, had changed the way people experienced Central Park through his installation of The Gates.



Fig. 7. Intimate Scale Proposal – Shuxin Wu

As students became more familiar with the site, they speculated on competition rules and parameters. They subjected site boundaries to rigorous internal debate. Students were tasked with deciding whether to conform to the rules, or to provocatively break them to achieve design resolution. For example, students developed one design that ignored the site boundary altogether and proposed an intervention on the nearby historic Hadley Common.

The studio insisted that students break the rules only in an effort to strengthen their projects. For example, the constructed form of the dike proved irresistible to some students who broke the critical rule that the dike must not be altered. Drawing upon land art precedents, these transgressive projects developed into tectonic berms, mounds made from old telephone poles, or abstract sculptural embankments.



Fig. 8. Competition Winning Entry – Laura Brooks

Other students found architectural solutions by physically connecting the public to the river. These forms included a barge theater, docks accessible by kayakers, and a fifty-foot long, colored picnic table. In addition, some students designed new ways to view the river, including an inhabitable "periscope," raised boardwalks, and reflective sculptures. Finally, one of our students won the design build competition for this site with a hybrid ramp and wall installation that raises spectators to a viewing elevation and then carefully constructs views of the river. (Fig. 8)

Conclusion

Bob Sheil, discussing the relationship between making and understanding design, writes that "the prospect of realizing ideas into built form is a transition during which some qualities are gained and others lost. As immaterial and intangible ideas develop, the question of how things are made generates a period of opportunity." ⁶

The studio's experiments in scale-jumping sought to highlight these transitional moments in design and to give students the confidence to apply this knowledge to their contextually grounded competition proposals. The studio's array of exercises, coupled with the competition's charge and scope, led to articulated constructions that engaged visitors with the River's history, ecology, and opportunities for physical engagement.

Working within the competition's proposed \$7500 construction budget provided students with strict explore the parameters to tectonic, dimensions environmental, and social of architectural expression. Following a winning competition entry in our studio, a new "period of opportunity" begins. This spring, when the project is constructed as a course collaboration between UMass and Yestermorrow Design-Build School, the lessons will leave the abstract realm of proposal to engage physically with the process of making.

Acknowledgements

Many thanks to my collaborator in teaching this studio, Professor Sigrid Miller Pollin FAIA, whose deep experience as an educator brings joy and rigor to studio experimentation, and who graciously took the winning entry into her office for further development.

Notes

¹ Killory, Christine and Davids, Renee. Details in Contemporary Architecture. Princeton Architectural Press: New York. 2007.

² This approach was influenced by Professor Edward Ford's body of work including The Architectural Detail Princeton Architectural Press: New York. 2011.

³ A portion of the studio's work was presented at the Riverscaping symposia with Professor Sigrid Miller Pollin.

⁴ From the Riverscaping Competition website. <u>www.Riverscaping.org</u> accessed on March 8, 2013.

⁵ These and other installations were brought to the studio's attention by Ronit Eisenbach and Sarah Bonnemaison's book *Installations By Architects* Princeton Architectural Press: New York. 2009.

⁶ Sheil, Bob. 2005. "Design Through Making: An Introduction." *Architectural Design* 75 (July / August): 5-12. John Wiley and Sons: London.