SYMPOSIUM: CONTEXT AND DESIGN (2 papers)

SOCIALForm: [re]Linking Architecture, Culture, and Environment

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First, What is Environment?

"[New spaces of habitation] build upon the shattered form of the old order a new category of order inherent only in present conditions, within which existence feels its strengths acknowledges its vulnerabilities and failures, and faces up to the need to reinvent itself as though for the first time.[1]"

- Lebbeus Woods

"Environment," in contemporary architectural practice, has come to embody issues of sustainability to the exclusion of most other considerations. This is an error. It places emphasis on architecture – as object – employing technology, materials, and design strategies to maximise efficient operation. However, it fails to realise that architecture is also a component of a social, historical, cultural, and spatial environment. Buildings that do not lend themselves to the betterment of this metaphysical environment are destined to fail. They will fail, not because they didn't work, but because they didn't engender the social investment necessary for them to work in perpetuity. Instead, can we define environment more broadly to encompass social forces as well? How can architecture be a product of the interrelationships between space and community?

Architecture linked to place cannot be derived from esoteric concept or require the erasure of existing circumstances to ensure ideal conditions for the idea to be feasible. Nor can it simply embrace a litany of "rules-of-thumb" for good sustainable design, which almost ensures placeless ubiquity for the architecture. What kind of value will an occupant, or community, place on such architecture? Will it be regarded as something worth saving when time renders it, or its function, obsolete?

Instead, shouldn't architecture – as inhabited environment – be a construct derived from both physical and metaphysical forces? Should it not regard the sun as both a source of heat gain, as well as light and color? Shouldn't material be considered for both its insulating qualities as well as its tactility?

Because contemporary practice and thinking tend to compartmentalise and separate contextual issues, this proposal draws from earlier theories in order to define new strategies linking architecture and environment. In it, architecture is seen as resultant. It emerges from the convergence of the realities of place, programmatic demand, and desired experiences. It is a designed environment integral to existing organizational, material, spatial, social, and natural systems. These are not new ideas. Many have explored them extensively[2]. However, design methodologies that effectively deploy them are rare.

This paper outlines techniques that reconcile physical and metaphysical environments toward the creation of truly responsive architecture. It supposes that implementing these techniques in the early design process can produce an architecture that is responsive to site. And, simultaneously consider the transformation of site by the addition of a new component. This position stands in stark contrast to the notion that architecture is imposed upon site; that it is self-referential. The foundations of these techniques are found in generative mapping. In which, the map is analytical rather than mere documentation. When represented using consistent graphic languages, the physical and metaphysical are understood in relation to one another. Systems of relationship are revealed through overlaps, alignments, and intersections between elements. The mapping prefigures spatial arrangement and tectonic assembly in ways that permit the architecture to emerge as resultant.

Considering the Environment

Environmental concerns are a primary consideration of the contemporary discipline of architecture. As are the technologies and design strategies that enable the architect to respond to those concerns through design. Although these concerns are imperative to the discipline and profession, they pose certain pedagogical challenges. Chief among these is maintaining a rigorous exploration of design principles and crafting techniques while introducing specific standards for environmental response. Students sometimes perceive environmental strategies as being at odds with spatial considerations. That they must choose between making the correct response for a particular environmental consideration and addressing considerations of spatial composition and experience. The foundational premise of this studio is that architecture is a

complex process of negotiation between seemingly contradictory forces. The best architectural response is one that can accommodate many different influences. This pedagogy strives to change the way students see their role as designers in the discipline of architecture. They must define themselves more broadly, not as choice-makers, but as explorers of design ideas. To do this, they need to be taught how to use graphic instruments as a means to reconcile design choices.

There is substantial (and dangerous) potential for architectural education to be reduced to formulaic compositions, for design thinking to be replaced by a short list of rules-of-thumb. Is it possible for the architect to be a steward of the environment without sacrificing those core design processes that have defined the discipline? Is it possible to introduce the vast knowledge of environmental design strategies within the time limitations set by a standard educational tract without sacrificing the development of a design process? Yes, in fact it is imperative. To accomplish this we must first stop addressing environment as a separate, overlaid issue that dictates form in response to weather patterns. Instead we must consider environment as the true surrounds of architecture. Thinking of it as an amalgamation of site forces that include climatic, cultural, and historical influences. These are all issues that can inform design decisions, and it permits the student to engage in a process of prioritizing these forces toward the generation of architectural ideas.

Much of this pedagogy has been evolving over multiple studios, at varying levels, at different institutions[3]. This paper will highlight a more recent development of it as it was applied to a project for second year students. The project was titled the "Ruins of Rocky Glen" and was intended to introduce students to ways of reading, analyzing, and responding to a landscape. Rocky Glen was a kind of amusement park filled with carnival games and rides. It has since been demolished and abandoned leaving just memories of its former structures in the form of foundation footprints and cracked, deteriorating pavement. It is located on a small, dam formed lake and is in the process of being reclaimed by the forest that surrounds it.

This site is chosen because of the importance of removing the word "nature" from the studio equation. Beginning students often misunderstand, misuse and ultimately get sidetracked by the implications of nature. Instead we focus on a gestalt understanding of environment. This opens students to the practice of considering the climate, topography, ecosystem, culture, heritage, and history of this seemingly forgotten place. They consider these things, not as isolated facts, but interrelated systems governing form and space.

A Mapping Pedagogy

"Stations and Paths together form a system. Points and lines, beings and relations… A complex system can be formally described[4]."

- Michel Serres,

How does one incorporate a sensibility for contextual response into a design studio of a discipline so dedicated to isolated innovation? In order to address this pedagogical concern, this paper proposes strategies for addressing fundamental compositional issues of the site in architectural education. Of special interest is a technique for generative mapping, the architecture that results from it, and the potential of this design process to affect the transformation of a place while preserving its unique character.

First, for the purposes of this paper, place is defined as an amalgamation. It is the collection of practices and traditions of a community as they are informed by climatic and morphological characteristics. For the city, it is a collective intelligence of a community. Architecture not only provides shelter, but is also a living record of the culture and priorities of a people. For a landscape, these instances can be subtle and more nuanced than their relatively apparent urban manifestations. Never-the-less, the ways in which mankind has used and occupied a landscape, no matter how undeveloped, will leave traces on the land, vestigial memories of culture. These have the capacity to inform subsequent design decisions. They are a part of the body of knowledge that distinguishes *this* place from *that* place. In understanding place through the subtle traces of human practice distinguishes it from location. Which, in contrast, is simply a geographic description.

The primary goal of this pedagogy is to introduce design ideas that position architectural intervention as a single component of a more complex system. In it, site is understood as interrelated systems, both cultural and physical. These issues are addressed in simple, compositional terms. The goal is not to introduce advanced theories of site response or the latest mechanical systems for making architecture more efficient. Instead, it is to instill within the architecture student a basic ethic for considering relationships between designed intervention and surrounding context.

To accomplish this, students are given a series of tasks that ultimately culminate in a descriptive diagram of the site. It is from this descriptive diagram that strategies for spatial and tectonic logic begin to emerge.

Students first embark on a series of mappings, diagrams, and analyses. This graphic research is a sort of site excavation touches on issues of topography, agriculture, vegetation, circulation, energy, history, ground, sky and programme. They search for latent organizational structures found within the physical site: molded terrain and network pathways. They look for ordering patterns in the arrangement of the greens. From these efforts they seek to extract a compositional logic to direct their own designs. But first, the students must understand the components that contribute to such patterns. We termed these elements site forces. They are any conditions acting upon the site formally, organizationally, or socially. These also include environmental factors such as large-scale topographic features, climate considerations such as water flow and sun direction, and the cultural context of the neighborhood and region. These peripheral forces make up an understanding of the contextual condition of the site. Local site forces are those that not only direct design decisions, but are also subject to manipulation as a part of the design scope. These include tectonic features of site: the trees that function as frames, or the densely packed vegetation as masses. These elements can be reconfigured, removed, or worked around. Other local forces include existing built form, and topographic features.

The ultimate goal of this process is to synthesise analyses of site disparate site forces into a common graphic language. This enables the student to study the site beyond casual observation. It is a position that simply going to a site – researching it; walking around it; documenting it – is not enough. This kind of site study is a superficial exploration of extant conditions. Origins, causes, and relationships often go unnoticed. The layered map is a means to excavate and interpolate this information toward the generation of the architectural idea. An idea that not only proposes the intervention of a new constructed environment, but also a transformation of existing site conditions. Can architecture be at once generated by the constraints of its surroundings and a force for directing their evolution?

This methodology identifies two positions to avoid:

- First is the use of contextual response as an excuse for willful formalism. This position is one in which students are compelled to use irrelevant or obscure contextual characteristics as justification for idiosyncratic, novel, or self-referential design. The complexity of any site provides innumerable opportunities for post-rationalised decision making enabling students to derive justification for architecture that is primarily a vehicle of self-expression. This kind of formalism is by its nature detached from its place in that it doesn't respond to the demands of the people that are to inhabit it. The role of the map should be to circumvent this approach rather than justify it.

- Second, is the fabrication of historicism logic based on the imagery of a place. This position uses context as a kind of pattern book and leads to designs that are amalgamate replications of existing conditions. It removes any accountability from the student as their decisions are strictly scripted by the image of material, ornament, and programme of surrounding buildings or the picturesque natural landscape. Design of this nature is also detached from its place in its disregard for spatial, formal, and programmatic systems.

Instead, students should understand fundamental relationships that comprise the interrelated systems of site and base design decisions on those. Students must be encouraged to observe the environment and use the act of making as a means to critically study it. More than this, students need to realise the way these characteristics are derived from, or affected by, cultural practices of the citizens of a place. The entire process is one rooted in investigation and inquiry.

Mapping and Cognition _ Emerging Spatial/Tectonic logic

"The city is seen as a gigantic man-made object, a work of engineering and architecture that is large and complex and growing over time[5]."
- Aldo Rossi

The documentation and analysis of these conditions leads to a process of design intervention that rationalises information extrapolated from the arrangement and distribution of site forces. In this process, strategies are invented for responding to these forces in order to accommodate the project programme. In order to understand the site, students analyze it by characteristics of constituent site forces and studying them independently. The component site forces include: topography, vegetation, solar orientation, position and arrangement of objects in the landscape, and materiality of ground. Students also track organizational strategies for: programme, new vegetation, interior and exterior circulation, cut-fill territories, and redesigned landscapes. This material is worked on simultaneously so the different parts can react to each other. Erasure is discouraged so that students can more easily track the different steps in their design process. When those analyses are then reconstituted, the synthesis results in a drawing that is not only documentation but also a site model that mirrors specific operational characteristics. This exercise becomes a point of departure for visualizing site conditions, as well as testing the implications of the designed intervention it is to receive. It is a long-term exercise in dynamic mapping.

As a part of this rationalization of site forces, students determine points within overlapping organizational patterns and spatial systems to determine site placement. The intervention placed there is a product of overarching compositional characteristics of its surroundings. Likewise, those surroundings are manipulated in order to optimise their accommodation of programme.

Can design ideas emerge from the act of mapping? Or, must they be originate elsewhere and be imposed upon site?

The premise of this pedagogy is that mapping can aid the designer in identifying latent logics for organization embedded in the site. And, that every place is a rich palimpsest of existing information to be mined. Under that assumption, it should be possible for organizational and tectonic strategies to emerge from those native to the place. The map becomes, not only analysis, but also progenitor.

- Systems of relationship identified in the map prefigure organizational logics for integrating new design into existing networks.
- Any existing constructs provide clues toward appropriate orientations, adjacencies, and proximities to augment the qualities of place rather than disrupt them.
- Existing spatial conditions containing social events can inform the arrangement and distribution of new interior spaces configured for programme and experience.
- Qualities of landscape can be exploited or changed to extend the architectural idea across the envelope and simultaneously direct design of space for both the interior and exterior.

In examining these possibilities, among others individually discovered by the students, the map becomes a tool that facilitates cognition. It is a device for generating ideas, not simply communicating them (Fig 1).

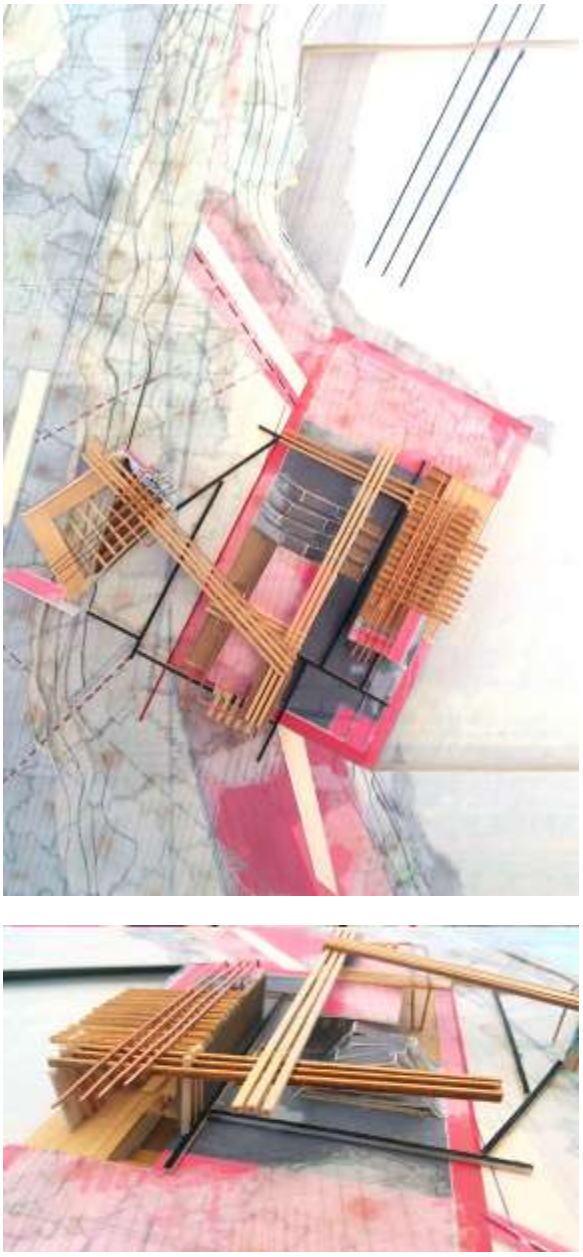

Fig. 1. Tectonic and spatial ideas emerge from the latent organizational properties of the map.

In the Studio

Each student, or group of students, is given a very specific site characteristic[6] to document in precisely measured detail. These characteristics are divided amongst Organizational, Morphological, and Programmatic categories.

Organizational Characteristics (Fig. 2)

- Edges/Boundaries – this student/group is responsible for mapping layers and edge conditions. This includes elements that compose boundaries between interior and exterior spaces, programmed layers of street edges, and the composition of elements that define boundaries of public civic spaces.

- Light Regions – this student/group is to chart various conditions of light as effected by solar orientation and landscape features. There are highly differentiated regions of light and shadow throughout the day that are critical in determining placement of a new building as well as tectonic strategies deployed in the design of its envelope.

Morphological Characteristics (Fig. 2)

- Materiality – this student/group is responsible for recording materiality of the site. The goal is to define the taxonomy of site materials, chart shifts in material across territories of the landscape, and define experiential effects of different materials across those territories (i.e. thresholds, reflectivity, texture, naturally formed vs. constructed, etc.)

- Objects/Obstructions – this student/group is responsible for documenting objects in the landscape. These can be construed as typical objects, or anything that might pose as an obstruction – an impassable clump of vegetation for instance. Trees, caliber of those trees, rocks, hill sides all factor into determining placement of the structure and the manipulation of the landscape around it.

- Topography – A typical topographic study augmented by the presence of man-made constructs altering the condition of the landscape.

Programmatic Characteristics (Fig. 2)

- Histories – This research group augments other student maps to account for past qualities of the traces documented by the students from other categories. Climate – This research group augments other student maps to account for qualities of sun angle. Specifically it accounts for variations in the Light regions map depending upon changes in the landscape. Additionally, it collects a body of climate data to be used in determining later architectural decisions.

Fig. 2. Layers of the map completed in group work

These layers are subsequently synthesised and redeveloped by each individual student according to priorities of his/her own project. The resulting mappings are overlaid and converted into compatible graphic conventions. It is in this synthesis of information that correlations and relationships are recognised between disparate site systems. These correlations are the subtle forces that define place and manner of dwelling[7]. They also provide the students with the necessary catalysts for design decisions relating to any intervention they might proposeAt this point, the project transitions into a stage where students design an intervention in this place. They have, from the beginning, been aware that they are to design a training facility for a crew team. While investigating site, they have also been researching rowing sports. They begin to understand the constraints provided by the dimensions of a scull, and the equipment necessary to operate it. They also begin to formulate a programme based upon the needs of a crew team that will live at this facility for the majority of a season.

With these constraints in mind the students set about the task of constructing within their layered site diagram. Lines of organization, territories, and material all understood in relation to one another provide a point of departure for arranging spaces and assembling components. Tectonic, spatial constructs are built directly into the maps responding to the graphic language established therein. The surrounding map acts as a kind of site model with preliminary proposals woven directly into its layers of information. It is also and a means of evaluating the success of different design decisions based upon the degree of integration with the various interdependent site forces. The resultant proposals evolve over time according to information gleaned from the map.

Transformations of place, disruptions in the network of site forces caused by the inclusion of the new piece of architecture are made immediately apparent. These transformations are also evaluated using the same mapping techniques as before, only now the new proposal is considered a native condition to the landscape. In analyzing their own ideas relative to existing context, the students are able to include an additional evaluative layer

in their design process, and another opportunity for ideas to emerge for subsequent iterations.

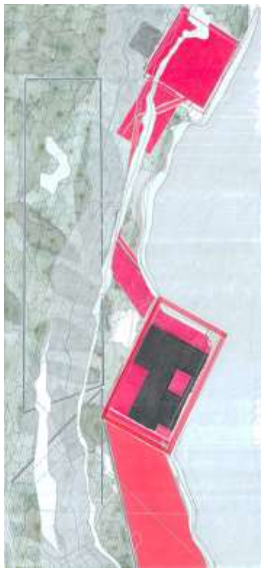

Fig. 3. The individual student synthesis

Context as Architecture

The programme requires that the architecture address the water. Lanes act as physical extensions from the interior of the building across the open lake. The Boathouse is a bridge across the edge between solid land and open water. The landscape is an integral component of the architecture, not simply a field within which a building is situated.

Single diagrams are drawn that show as single graphic entities: programme, circulation, vegetation, and cut/fill. In addition, these diagrams are coded to distinguish between existing, removed, and added components: how many trees have been added, which ones have been kept, how do they interface? This step is important in order for students to see that the different systems have their own internal logic besides a larger contextual rationale.

Synthesizing the design strategies formed from mapping and response results in an understanding of site design as component of architectural design. Landscape is seen to have programmatic and spatial consequence equal or even greater to that of their buildings. There is a broadened sensibility that site context consists of visible and invisible forces and that a rich interchange beyond the lines of an individual building can reinforce the cultural robustness of their design intentions. Students gain an awareness of the intrinsic alterations produced by the process of intervention. The architecture is a vehicle for manipulating and exploiting existing site forces. Site forces direct the architectural configuration of space and form. This understanding yields a cyclical process of discovery, response, and manipulation that oscillates between the scales of site and building.

Leaving this studio, the student has integrated design thinking with environmental consideration. This fusion prepares them to meet future, more sophisticated challenges, wherein they will be equipped to manipulate, and compose tectonic form as a servant toward the spatial environment. Questions of spatial ordering and system organization will become more automatic so that they will be able to conduct deeper research into other issues. They will be able to use assemblies to exploit characteristics of the environment toward the configuration of space and the production of experience ultimately yielding a more culturally durable order for architectural space.

Notes

[1] Lebbeus Woods writes about the "ethical and moral commitment in such an existence" of a place that is evolved from present conditions rather than replaced by an imposing design vision. This seemingly stands in contrast to woods' proposals, but the way in which he applies this logic to formal composition can also be applied to systemic integration.
Woods, Lebbeus, *War and Architecture: Pamphlet Architecture 15*. New York: Princeton Architectural Press, 1993.

[2] Kevin Lynch, Aldo Rossi, Collin Rowe, Fred Koetter, et al have written extensively throughout the 1980s regarding issues of urban design according to the constraints of place. Those texts successfully framed critiques of non-place based urbanism and outlined priorities that should be better considered. What was missing was a clear set of applicable strategies for this kind of urbanism. These paper seeks to build upon that critique a strategy for generating place responsive architecture.
Lynch, Kevin. *Good City Form*. Cambridge: The MIT Press, 1984.
Rossi, Aldo. *The Architecture of the City*. Cambridge: The MIT Press, 1984.
Rowe, Colin and Fred Koetter. *Collage City*. Cambridge: The MIT Press, 1984.

[3] I have worked on versions of this pedagogy with Professor Karl Wallick, associate professor at the University of Wisconsin: Milwaukee. We have not only taught together but published and presented some of this research in prior efforts. I have continued to develop these strategies and implement them in my studios at Marywood University.
Eckler, James and Wallick, Karl. "Rationalization and Reconciliation" *2011 National Conference on the Beginning Design Student Proceedings* (March 2011).
Eckler, James and Wallick, Karl. "Unplanned City: Preserving Place through Urban Making" *2012 ACSA International Conference Proceedings* (June 2012).

[4] Stan Allen quotes Michel Serres to open Points and Lines. Allen and several other authors go on to describe strategies for integrating architecture into the existing systems of the urban context in a way that "involved the renunciation of perspective in favor of other notational and cartographic systems." This logic plays a major role in the generative mapping pedagogy described in this paper.
Allen, Stan. *Points + Lines: Diagrams and Projects for the City*. New York: Princeton Architectural Press, 1999.

Quote originally from: Serres, Michel. *The Parasite*, trans. Lawrence R. Schehr. Baltimore: Johns Hopkins University Press, 1982.

[5] Aldo Rossi refers to the city as a "gigantic manmade object" in order to illustrate that a single piece of architecture is a component of the larger urban system. Additionally, Rossi refers to architecture, that has "developed in both space and time" as "urban artifacts" that act as a record of the cultural history of a place.

Rossi, Aldo. *The Architecture of the city.* Cambridge: The MIT Press, 1982.

[6] Kevin Lynch formulates a list of criteria for analyzing and determining success of urban form "based on spatial qualities and which are measurable scales, along which different groups will prefer to achieve different positions." This set of criteria closely mirrors the methodology for "Generative Mapping" that I propose in this paper.

Lynch, Kevin *Good City Form*. Cambridge: The MIT Press, 1981.

[7] Christopher Alexander describes the interdependence of human behavior, urban spatial systems, and infrastructure. In a short narrative he demonstrates that activity is determined by the interdependence of "the newsrack, the newspapers on it, the money going from people's pockets to the dime slot, the people who stop at the light and read papers, traffic light, the electric impulses which make the lights change, the sidewalk which they stand on form a system – they all work together.

Alexander, Christopher "A City is Not a Tree" *Architectural Forum* 122, no. 1, April 1965: 58-62.