Footloose—A Transformation of Space

"In the final analysis, a drawing simply is no longer a drawing, no matter how self-sufficient its execution may be. It is a symbol, and the more profoundly the imaginary lines of projection meet higher dimensions, the better."

— Paul Klee

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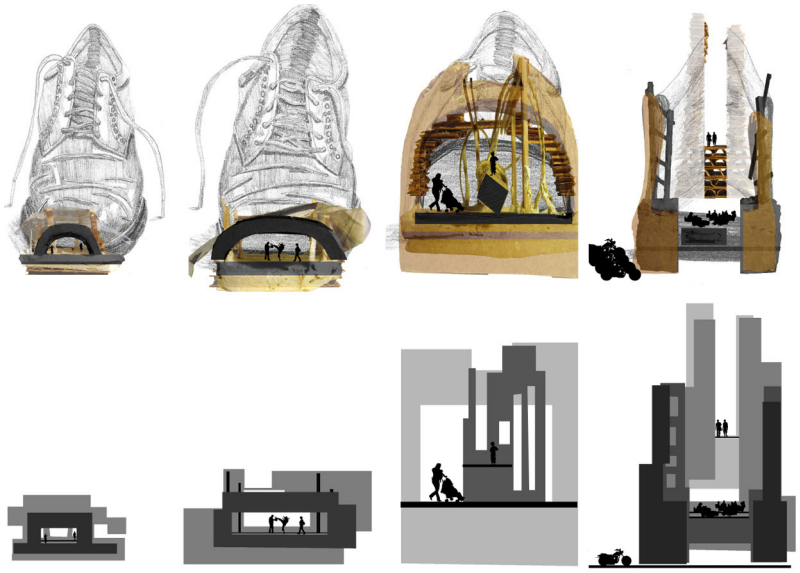
THE NON-TRADITIONAL SECTION AS INFORMER

Learning to use the computer as a projective design tool, rather than a time-consuming representational device, is essential to beginning designers as they develop habits that will influence their education and continue into the profession. Traditional beginning design studios take students outside the world of their experience by teaching representation strategies that rely on abstraction. This project attempts to integrate hand techniques with digital image manipulation to extend and reinforce the lessons of spatially based conceptual design exercises.

In the project "Footloose, A Transformation of Space," students combined process oriented explorations with digital media and were encouraged to think through the computer and the hand simultaneously to reinforce the importance of multimedia processes in early design development. The speed of digital manipulation allowed students to quickly grasp how conceptual design translates into human experience. This pedagogical model encourages students to develop a digital sensibility at the inception of their design process.

Footwear was randomly assigned to each student and a "boot camp" encouraged the students to graphically explore the object utilizing various sketching exercises. Unique qualities of each pair were reinterpreted through model building. Continuing in the Bauhaus tradition of teaching ''how to see,'' students combined process oriented explorations with digital media and were encouraged to think with the computer and the hand simultaneously. (Gropius, 1938) Students were asked to consider the shoe as a vessel at two scales; could it ultimately embodying similar tectonics and be translated to create space at a habitable scale?

The left shoe was physically sliced lengthwise to inform the observer of its internal workings and then graphically represented by hand in twelve cross-sections as a departure point for developing a spatial sequence. These drawings were distinctly abstract and at 1:1 scale of the physical models. By presenting the



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sections in a side-by-side series, students learned to see sectional moments within a larger whole. This step sets the framework for designing space through a progression of abstractions. Rather than using their limited frame of references for ‘‘space-making’’, students were confronted with sectional shapes predetermined by their footwear.

DELVING INTO THE DIGITAL

A model demonstrating the qualities of each specific section was constructed, introducing the notion of the shoe as architecture through connections and spatial sequence. The individual models were ½” thick, and twelve were built with horizontal corrugation and 12 were constructed using the vertical corrugation. Each student used corrugated cardboard as a material platform to understand the strengths and weaknesses of the structures. Obstacles students faced while making full-scale models encouraged them to consciously appreciate the flexibility of working within computer space and its inherent lack of gravity. Constructing a physical model forces the maker to commit to decisions and problem-solve in real time. The rigorous discipline of making is a critical supplement to digital design, as it remains the closest medium to the reality of buildings. Photos were taken of the models, and were digitally aligned and corresponded with the scanned hand drawn sections. Students were encouraged to “play” with the Photoshop - familiarizing themselves with the basic components the program offer.

The introduction to Photoshop produced a collage of information where the individual element informed the next and overlapped to create a tectonic assembly of space in a sectional format. (FIGURE 1) The simple gesture of introducing digital poche and human silhouette figures produced a direct correlation of scale and therefore created an easily recognizable image for the beginning design student to grasp.

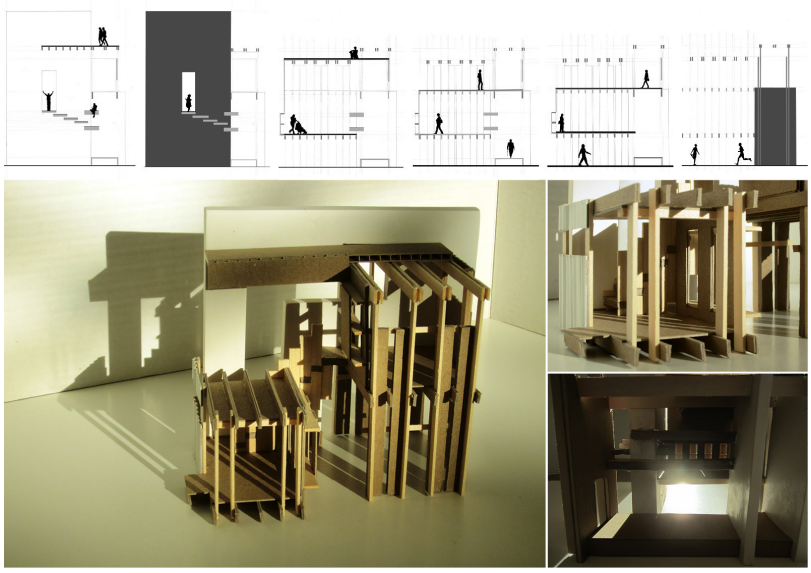
An acute moment in the trajectory of the studio arrived when students were introduced to the illusion of three-dimensional depth on a two dimensional computer screen. This encouraged digital experimentation. ‘‘To experiment is at first more valuable than to produce, free play in the beginning develops courage.’’ (Albers, 1938) Students were taught to ‘‘multiply’’ their interpretive sections in Photoshop, overlapping each sectional drawing by aligning the size of its digital figures. By

Figure 1: Sectional Side-By-Side Series with digital overlapping , *(Student: Elizabeth Andrzjewski)*

grouping the sectional composites into various scales, they were able to generate an array of possible human experiences. Students delaminated each sectional composition into a physical model within prescribed dimensional boundaries.

STUDY OF JOINTS TO PRODUCE TECTONICS

Again moving back to the physical, tangible models offered the opportunity for beginning students to use their two-dimensional sections as maps for tectonic discovery. This discovery was explored through a series or joints, each creating the basic tectonic language of frame, plan and mass. A simple program introduced the gesture of connecting two spaces, one primary and the other secondary. Basswood, plaster and chipboard were assigned to inform materiality and test the creation of space. (FIGURE 2) The spaces were assembled using construction methods informed by discoveries made through the initial drawing exercise. Students explored material limits through scoring, folding, cutting, and invention of connections inspired by the internal mechanisms and tectonic discoveries of their footwear.



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HUMAN SCALE TO GENERATE SPACE

Assigning a simple program of a small, temporary, on-campus gallery to exhibit the shoe and an intimate place of reflection occupied by a maximum of four visitors assisted with the progression of design and purpose. By prescribing the scale of a program rather than its use, this exercise presented the opportunity for students to design a spatial narrative by simply manipulating and combining the size of figures on a computer screen. The consideration of the spatial and dimensional requirements for displaying and viewing enabled students to consider architectural spaces with specificity. The choreography of a viewing sequence allowed projects to have two interior focal points within a narrated experience. Contrary to typical architectural representations where figures populate a rendered view, the figures are tested to give meaning to each view. This exercises of moving from hand to computer and back to hand drawing, worked to refine the students' sensibilities and discover the impact of moving between manual and digital production within the same project.

Figure 2: Sectional Side-By-Side Series with Tectonic Model Assemblies *(Student: Elizabeth Andrzjewski).*

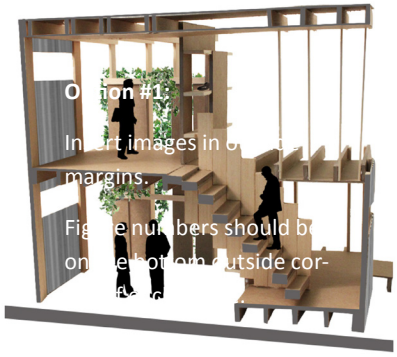

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Figure 3: Digital Comprehensive View driven by Manual tectonic Assembly, *(Student: Elizabeth Andrzjewski).*

THE TRANSITION OF MANUAL TO DIGITAL

The design profession currently relies heavily on sophisticated software to generate the sectional perspective, a powerful representation tool that communicates the concept, experience, and materiality of a project, all in one view. This type of rendering typically requires that a three-dimensional computer model to which we assign materials, then use another program to assign lighting and generate the rendering, which is then ''cut'' to describe the comprehensive view. (FIGURE 3) As it is important for beginning students to absorb spatial lessons through focused exercises, this type of representation is generally premature in a foundation studio because it requires a high level of digital facility and detailed technical knowledge. However, using Photoshop as a projective tool, students were taught to generate sectional perspectives as digital collages that test ideas rather than represent designs. It required an immediate and direct participation from the designer and provided a setting for opportunistic accidents to occur in the computer. Using two-dimensional section drawings and model photographs as a point of departure, students learned to produce digital vignettes that quickly explored scale and materiality in the third dimension. This type of manually driven digital collage is an invaluable skill for beginning architecture students, allowing them to experiment with ideas without the rigorous constraints of computer modeling and rendering. (Lin, 2012)

CONCLUSION

This type of graphically oriented introduction to Photoshop allowed students to learn the program's ability to amplify and express specific attributes of their handcrafted drawings. This exercise presented the opportunity for students to design a spatial narrative by simply manipulating and combining the sizes of the figures on a computer screen. Contrary to typical architectural representations where figures populate a rendered view, the figures give each view meaning. With this application, students begin to understand how to manipulate a digital image with restraint and scalar specificity.

Using the twelve sections as a conceptual map, students manually translated the computer generated sections into assemblies emphasizing the tectonic principles introduced in two-dimensions. These models were married to programmatically produce two comprehensive spaces, registering the connections and showcasing the explorations of the shoe. The physical shift back into 1:1 scale was an important step in fostering the awareness of the influence of digital media, as well as allowing students to develop both manual and digital skills at the same pace.

This example of a beginning design sequence demonstrates that students can be taught to think simultaneously through the computer and the hand. Appreciating the computer as a projective tool in this studio model promotes an actively engaged digital user that is able to design intuitively with the computer. Working back and forth between the hand and the computer at the onset of a design education enables the students to control their own process at each level without being limited by the manual or becoming trapped graphically by the digital and will influence their design sensibilities as they continue into the profession.

ENDNOTES

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