

Digital and Analog Strategies for Design Studio

School of Architecture and Design
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California

BY THOMAS FOWLER, ASSOCIATE PROFESSOR

INTRODUCTION

In a third year design studio, assignments are crafted for students to refine skills in both digital and analog media tools (physical modeling and traditional drawings), to allow them to see the advantages and disadvantages of both, to develop a critical attitude towards media and to develop a design project using these tools. Students start out the quarter participating in a week-long group warm-up diagramming exercise that allows students who are not as familiar with **form·Z** to learn how to use the software in the context of completing a design assignment. Groups are arranged with students who are familiar with **form·Z**, along with students who are not. These groups of no more than four students collaborate and the students who are least experienced with the software are exposed to a fair amount of the software navigation as the student or students who know the software assists in this process.

Students in the process of developing their individual design projects for the quarter use the diagramming and modeling strategies learned from this warm-up exercise. Early individual design exercises are exploratory and students are encouraged to use **form·Z** for its iterative ability and its facility in generating rich graphic vocabularies that are suggestive of spatial character and experience. The use of **form·Z** is balanced with physical model building and traditional drawings to sort out issues of scale and siting. Later exercises such as programming models and 3D vocabulary models, along with sun diagram overlays, require students to translate early vocabularies into working building elements.

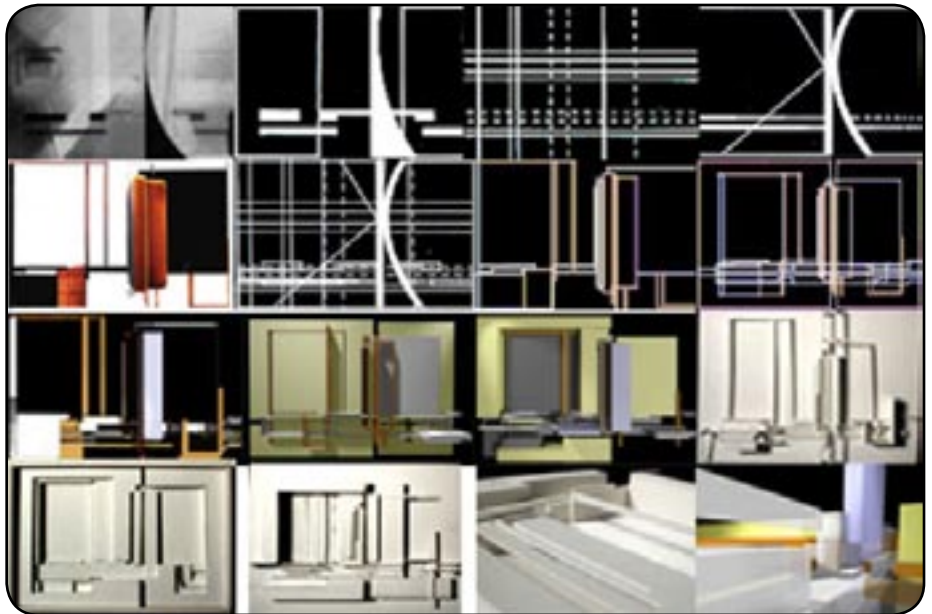


Figure 1: Warm-Up Exercise Summary

GROUP DIAGRAMMING WARM-UP EXERCISE (Figure 1)

This seven-step analog and digital exercise is based on Bauhaus principles of craftsmanship and visual perception. A strict set of guidelines applied foundation principles of the Wassily Kandinsky method of analytical drawing that breaks a still life composition into diagrammatic forces to express tension and geometry. Each step alternated between analog and digital media. This exercise started with still life images, then proceeded to acetate overlays, to analog/digital diagrams, analog/digital relief models and ended with a spatial manipulation device. The outcomes from these group projects provided a foundation strategy for individual student project processes.

EXERCISE 01: Poetic Site Readings (Figures 2,3,4)

In this exercise, diagram and relief models identify elements from the context that are significant to the student designer.

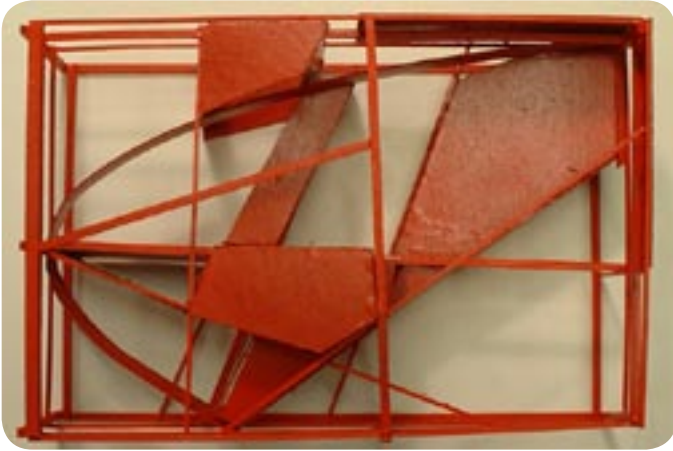


Figures 2,3,4: Poetic Site Readings

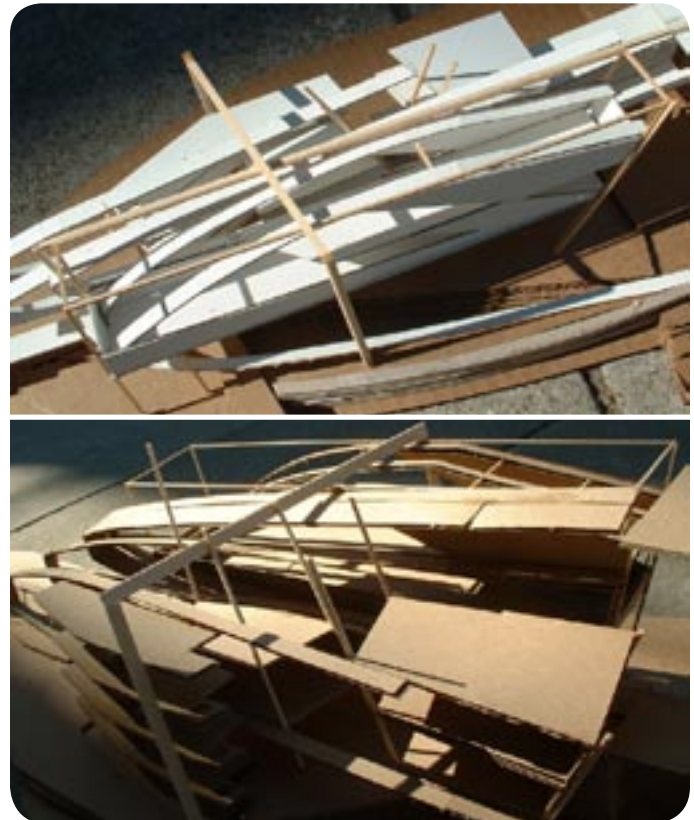
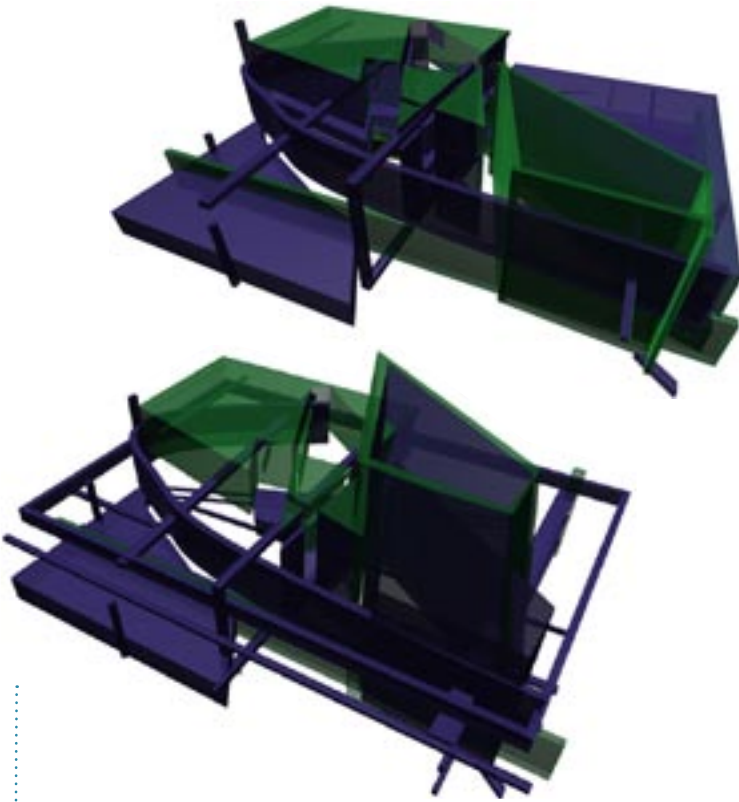
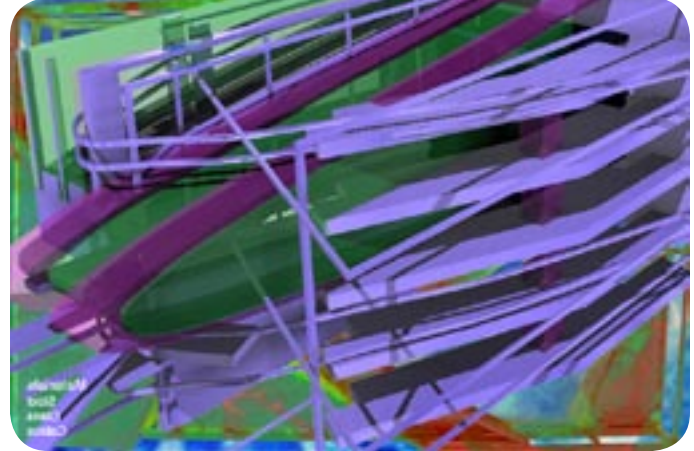
INDIVIDUAL STUDENT PROJECT PROCESS COMPONENTS

Shown below is a currently in process project (Fall 2005) that shows the analog and digital component pieces for the design project. This is a multi-use project that is sited in New York City. All work is by the third year student Katsunori Shigemi.

EXERCISE 02:
Analog and Digital Relief Studies of Space (Figures 5,6,7)
Site diagrams and relief models provide a strategy for exploring the space sectionally.



EXERCISE 03:
Analog and Digital 3D Vocabulary Studies (Figures 8,9,10)
Sectional relief model studies provide the strategy for exploring the architectural vocabulary of building project.



Figures 5,6,7: Analog and Digital Relief Studies of Space.

Figures 8,9,10: Analog and digital 3D vocabulary studies

CONCLUSION

Going back and forth between **form•Z** and analog media offers the advantage of revealing more quickly and more clearly weaknesses in a project as well as inconsistencies between a student's original intentions and what is revealed in their work. The successful students quickly make connections to the linkages between the digital and analog components of the emerging process of project.

PROGRAM DEVELOPMENT

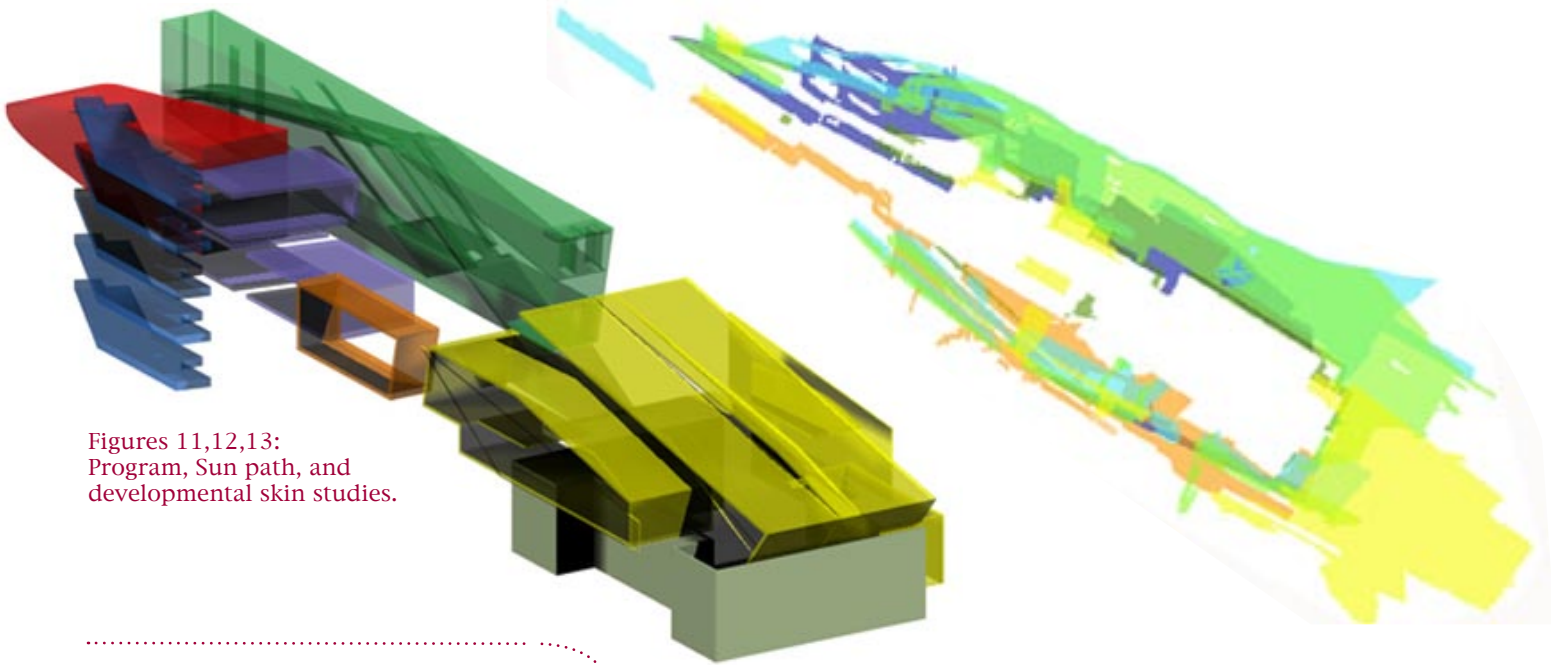
Programmed spaces were explored as 3D volumes and developed as 3D inhabitable volumetric models. Spatial adjacency relationships were then explored and analyzed. With **form•Z**, I developed volumetric program models very quickly. With the transparency of the shapes turned on, I was also able to create overlapping spaces. With analog models it was harder for me to develop intersections and connections in the program on an efficient timeline.

PROJECT REFINEMENTS

With the programmatic volumes defined, I went on to develop and refine the 3D inhabitable volumetric vocabulary models to work with the program. I first worked with an analog model to develop the overall quality of the spaces. Then with the development of my analog model I was able to work into my digital 3D inhabitable volumetric vocabulary model to refine and open up the spaces to fit my program. By continuing to work into my digital models, I was able to refine and keep the richness and complexity of my early vocabulary studies. I also continued to look at the spaces through both cross and longitudinal sections as well as immersive views taken from within the **form•Z** model. Throughout the design process I also looked at the project through a sequence of events, with the help of the animation tool and key frames of **form•Z**, I was able to create multiple short movies, rendered in RenderZone at 100 x 150dpi. The low resolution of the movie allowed me to see what was working and what was not without wasting time rendering.

In the final development of the project, I focused on the quality of the interior spaces by studying immersive views of my digital model using **form•Z**. I also developed and refined my circulation so it could be integrated into the double skin of the project. Looking at different layers of the skin in **form•Z** allowed me to see if the circulation was working within the spaces. I explored the use of color, transparency, and textures using **form•Z**'s **RenderZone**. A large-scale cross-section drawing allowed me to further develop and articulate the skin and structure of the building. While developing the skin of my project it was important to look at all the elevations including the roof in a developmental folded out manner. With each side of the structure facing a different orientation, it provided a great opportunity to create unique solutions for each of the different orientations. These folded out elevations helped me to outfit the envelope to react to the site orientation along with capturing appropriate levels of day lighting.

EXERCISE 04: Program, Sun Path and Developmental Skin Studies (Figures 11,12,13)
Programming, sun path, and skin study models are developed from architectural vocabulary models.



Figures 11,12,13:
Program, Sun path, and
developmental skin studies.

PROJECT DESIGN REFLECTIONS

In Professor Fowler's design studio I learned the process of using **form•Z** as a design tool for "thinking through my hands" (a Malcom McCullough phrase). By building and creating so many digital and analog models, I developed an architectural vocabulary for my project that was able to evolve over the duration of the quarter. While developing my project, the analog models seemed to be what initially drove the design of my project. The digital and analog relief models helped in the development of the project's vocabulary model and helped to better simulate the project montaged into the project site. **form•Z** provided me the opportunity to refine and develop my project, even though my **form•Z** skills were not very strong. It seems that in reflecting about my design project, that if I had worked only in a digital media I would have limited my design to what I could do in **form•Z**. By going back and forth between digital and analog media throughout my design process, it forced me to learn new strategies for design as I was working with **form•Z**. All aspects of the process were a development from the original diagrams and relief models that were in response to the Tsunami Disaster.

