The Sandbox: A Cross-Disciplinary Foundation Design Unit

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The course within the university:

Visual Literacy is a two-year-old cross-disciplinary instruction unit that encompasses a "learning community" of Textile and Clothing Design, Architecture, Interior Design, and Fine Art students in their first year of foundation design education. This pedagogy is a three week long unit (with 9 hours of contact time per week) in a two semester long program. Each faculty member teaches one of four thematically charged instructional units through which studio sized groups of students rotate over the course of a semester. The thematic foci of the four units are Drawing, Color, Frame, and Form. This specific unit is the Form unit. Though it is taught by architecture faculty, every effort is made to keep it focused on an interdisciplinary, foundation design sensibility rather than letting the study of Form become "the architecture unit."

The intellectual focus of the unit:

In the same way that direction and speed are the component conditions of Velocity; surface and volume are the elementary conditions almost universally found in Form. The general proposition here is that this three-week unit will explore this dichotomy for Form on the gritty surface in the volume of a sandbox. From these studio exercises will come a "superficial understanding" of Form.

Questions that are addressed in the work of this unit are:

What is Form? Surface? Volume? Space?
What happens to Form and Space when a Surface is manipulated and defined in a thoughtful way?
What are the dimensions of Surface?
How can one graphically record a Surface?
How can one read Surface and Form from a graphic?
What are the ramifications of having a "superficial understanding" of Form?

Ultimately, the idea that is explored and tested by the student the most is:

Surfaces are the visual manifestations of form.

Paths of study that run through the course:

Of the roster of students who enter the "Vis Lit" program it can be expected that less than two-thirds will matriculate through professional design programs of study in which they will learn to actively alter the environment around us through Art, Architecture, Interior Design, or Textile and Clothing Design (TCD). Statistically, the number of students who do not pursue one of the design arts through to graduation may be lower or higher than one-third however, as the program is a new one, this is a safe nominal figure for discussion.[1] In its position as an introduction to the world of the arts it seems Visual Literacy exists for two fundamental reasons:

a. to begin design foundation curriculum instruction for a set of students who will go on to traditional roles in the design fields, and
b. to offer an opportunity to those students who, if given the tools, appreciation, and understanding, can impact the visual arts as intellectual patrons or simply through the application of design principles in "everyday life".

An analogous pedagogical model could be drawn from Italy where one of the most common "first degrees" (bachelor's level) in college education is an architectural one, but the goal there is not to mould each student who studies into a practitioner or to flood the professional market with architects. In Italy, architectural training is a strong and broad "liberal arts" basis for further study in a variety of fields and is understood as a valuable and canonical appreciation to have in any part of society. To put the position of the Visual Literacy Program within the university more succinctly; we are teaching both fundamental design and basic "design culture" through Vis Lit. Design culture includes worlds of patronage, fetish, appreciation, connoisseurship, criticism, and fellowship through the creative arts. To ignore or downplay the opportunity for the immersion of a broad collegiate community in design culture through the Visual Literacy program is to miss (at least) half the opportunity at hand.

What is needed is a pedagogy in Visual Literacy that teaches the superficial qualities of Form and Form-Making to both student Visual Literacy tracks in an engaging way that neither becomes "design for non-majors" nor a "Pieta Making 101" course.

Underpinnings of surface in the "Baroque and Suburban" (figure 1):

This three-week unit addresses these issues by taking a superficial or "Baroque and Suburban" approach to an understanding of Form. It focuses on the formal potentials of a surface.

A dominant specification of the Baroque is an emphasis on suppleness and momentary qualities of surface in form making. More specifically, there is an explicitly disturbed sensation of surface that Baroque Form offers. In the "The Abduction of Proserpina" by Bernini or San Carlo al Quattro Fontain in Piazza Navona or in Michelangelo's "Pietá," the stone is sculpted as the interplay between a supple and singular surface and discrete insertions of disturbance (attractors and detractors) across that surface. These disturbances manifest themselves as elements, sub-surfaces, maxima / minima, and inflections in the surface.

The suburban notion is found in what J.B. Jackson calls, "an orderly composition of clear cut, well defined forms" that shows, "a preference for the horizontal over the vertical."[2] The emphasis on the ground plane that the suburban reveals is another moment in practice where design focused on a singular surface and the play across it. In opposition to the disturbing nature of the Baroque there is a formally non-invasive but intensive apportioning of surface that is manifested by subdivision, alignment, fields, boundaries, elements, and delineations. Either way both of these models push the limits of how surface can exceed, replace, or direct the orientation of Form.[3]

A persistent condition of both the Baroque and the Suburban is an obsessive manipulation and control of surface. In both of these understandings of Form and its relationships there is study of "**the** surface" and the discrete conditions that populate it. In each understanding an emphasis is placed on the sculpting of the surface and the arrangement of the objects within it. From the Baroque we gather limits of fluidity and suppleness of the surface and from the Suburban we can take horizontality and a specific quality of density and intensity on the surface. One could suggest that for a Mid-Western first year student such horizontal and "Suburban arrangements"' might be the most common sort of form making in their life experiences and "Baroque arrangements" probably are a rare or unknown first hand experience save for some exposure through the literary and performing arts.[4] Infecting the horizontality and organizational surface of suburban thinking with the disturbing and supple qualities of the surface serves as an underpinning of the way Form is understood.

So, as in both the Suburban and the Baroque, the emphasis (and introduction) here in this pedagogy is on **a** fluid, finite surface and potential relative relationships within it rather than the

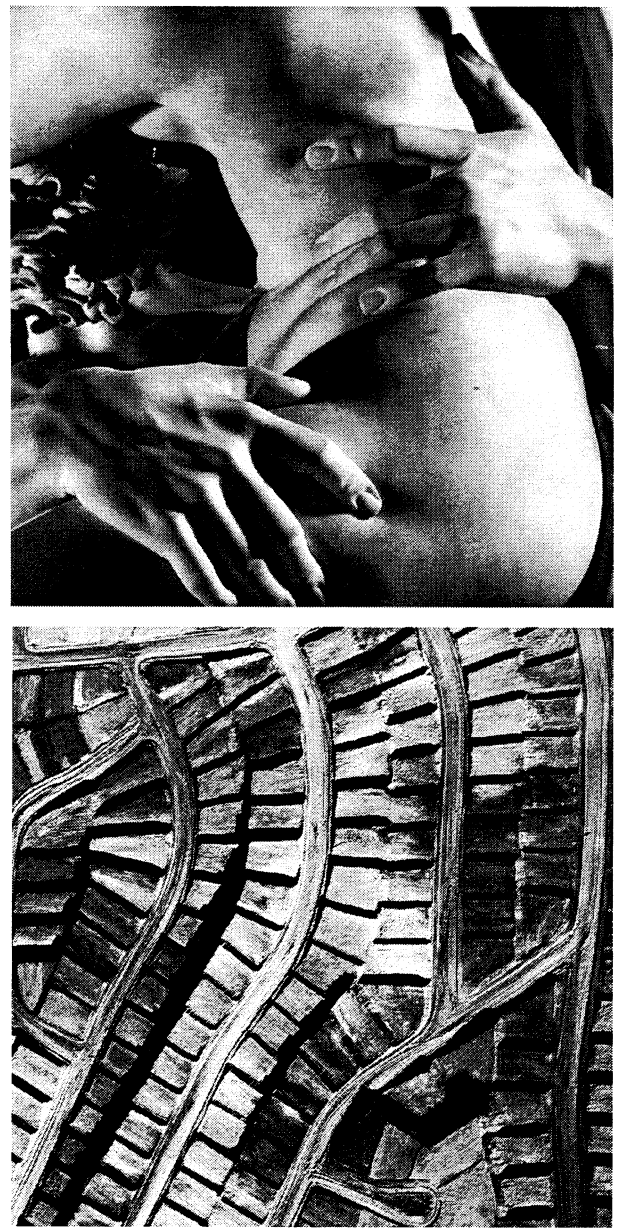

Fig 1. Samples of "Baroque and Suburban" form. "The Abduction of Proserpina" by Bernini and an image from The American Aesthetic by Nathaniel Owings (New York: Harper and Row, 1969).

sculpting and forming of an artful three-dimensional thing in universal space. The Form Rotation Unit tries to treat this emphasis on a surface as an other than three-dimensional or as a quasi-three-dimensional idea but yet more than a study of two-dimensional composition. Specific examples of this spatial model are drapery, flesh, and landscapes or any other things inhabiting what Stan Allen calls "thick two-D".[5] Focused and thoughtful working in this "in-between" spatial realm of surface draws out and clearly distinguishes issues of Form and form-making specifically by omitting half of the composition of the answer to what makes a Form: Volume. Additionally, centering the study of Form on the Surface repeatedly induces a critical moment in the process when translation between two and three dimensions (and vice versa) occurs in design thinking. But ultimately it is positioned that underpinning the Sandbox exercise

with this mix of superficial concepts in the Suburban and the Baroque, thus making the knowledge and skills gathered in the unit both a valuable liberal arts experience and a strong foundation design introduction in the university.

The sandbox and the sand surface (figure 2):

The sand box interior is 20 by 20 by 10 inches in height and it contains exactly 20 by 20 by 5 inches deep of sand so that the interior of the box is half-solid / half-void. The idea of using a sandbox as the primary vehicle of inquiry in a cross-disciplinary first year design curriculum is transparent with playful innuendoes and diversionary references. Inherent in the use of sand is the opportunity to work with at once a voluptuous and loose, yet massive and volumetric material. The sand is a granular solid that is under the influences of gravity and its cohorts friction, cohesion, and angle of incidence. Its entropic state (condition of stasis) is a flat surfaced, level, five-inch deep granular pool in the box. Sand can seem as much liquid as it does a solid and interestingly can seem less viscous when water is added. The forming and locating of the sand surface evolves into a series of exercises where the surface condition is as much determined by the placement of elements that delineate discrete spaces across the surface of the sand as it is in any precedent introduced at the outset of the rotation. This almost viscous potential in modeling the sand surface combined with the superficial augmentations and transformations that come from the arrangement of discrete elements across its face is an incredible laboratory for inducing and exploring the surface of form in its Baroque and Suburban formal relationships.

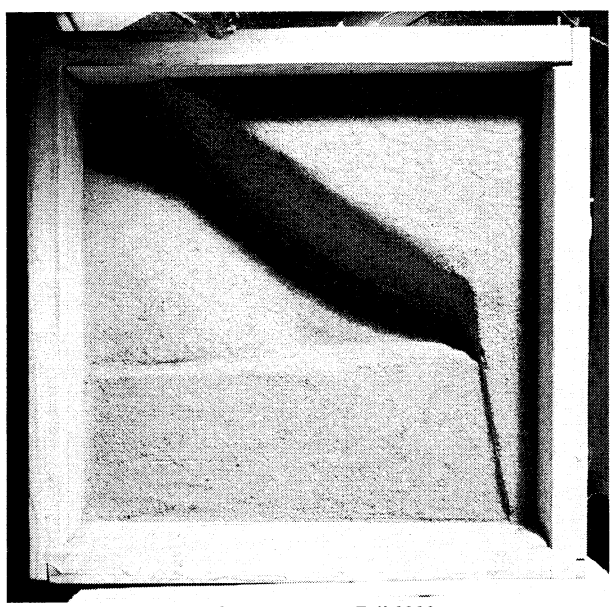

Fig 2. Initial student surfacing exercise, Fall 1999.

The unit methodology:

The unit is made up of a series of highly focused and discrete but additive and incremental exercises where the thoughts and products of one day become the basic material for the next.[6] The structure of the work in the exercises encourages playing pragmatically, tinkering in the sand, and sculpting. This pedagogic structure, including the discussion about the product that emerges from it, effectively helps to build an understanding that is not based in architecture or any other discipline. A major component of the daily instruction is a time in which the students talk about each other's work in a critical way. In the execution of this critique it is highly stressed that the conversation about the contents of the sandbox focuses on adjectives and verbs on the subject of the sandbox rather than the noun thoughts of external reference. So, statements of "It is..." rather than "It looks like..." are encouraged. The value of the lesson's self-referential nature for the Visual Literacy student is enhanced when it is tailored to be non-representational, when it is simply actual-scaled, and open to a diversity of external references in criticism (drapery, landscape, flesh, etc.) through its incessant denial of external sources and images in making as well as in introducing criticism. Ultimately, these exercises based in "A-disciplinary" tactics result in solutions for cross-disciplinary strategies demanded by the demographics of Visual Literacy.

The role of drawing:

In addition to the tactical methods already described such as exercises based in working additively and incrementally, the inherent playfulness and suppleness of the sandbox, and the focus that superficial thinking (Suburban and the Baroque) offers; there is another key technique in the curriculum that should be illuminated. In this unit graphic techniques common to any one disciplinary field are eschewed for methods that are either hybrid, primitive, or obscure within our design disciplines but invoke a strong lesson in form making. In this rotation drawing has as much in common with a pattern in dress-making, Duchamp's "Standard Stoppages", and templates in graphic design as it does with a tectonic designer's building section.

In almost every aspect of the nit drawing acts as a resultant or qualifier of the surface condition inscribed in the sandbox. As soon as the first surface exercise is executed in the sand the student is confronted with finding methods for plumbing the section of the sand without disturbing it.

Discovery in drawing is found by using methods and techniques of abstraction that reveal and illuminate unseen and non-visual conditions rather than scenographically representing what can be seen. From the beginning the privileged position of being above the Sandbox is ignored graphically in favor of cross sections that make invisible slices through the overall form visible. Initially, the graphics read simply as silhouettes; two-dimensional and binary (black and white, solid and void) but evocative and expressive translations from the surface in space. As elemental placements and locations enter into the section an intermediate tonal area is introduced but the drawing is still com-

posed of fields fashioned from colored construction paper scribed with a knife. Nowhere within the exercise is space diagrammed with a line. The drawing technique is centered on carving with a knife and locating with cement. This denies the ability to use a line to delineate space and reinforces the ongoing studies of surface. So here in drawing the "cross-disciplinary nature" or strategy of the course is once again reinforced by a reductive and "a-disciplinary" set of techniques and methods.

A visual & descriptive unit chronology from start to finish:

- *The Ventilated Drawing Exercise (figure 3):*

As an inductive exercise the student is asked to photocopy an image on a piece of paper and to interpret or enhance aspects in the image by "ventilating" or "fluffing" the surface of the paper with an X-Acto knife and straight pins. Ventilating the surface of the sheet can include folding, slicing, bending, curling, squeezing, twisting, sticking, propping, pushing, crimping, splicing, and shredding the surface according to traces found in the image. As a conclusion to this exercise the surface is painted to obscure the image. Evaluative discussions focus on the ability of the modifications made to the sheet to convey both qualities of surface and form. Questions asked at this juncture are:

What is a surface?
What relationships do form and surface hold?
When surface is a part of form?
When form is part of a surface?
How is form impacted when a surface is manipulated?

- *The Surfacing Exercise (figure 4)*

The Surfacing Exercise is a translation of the topographical qualities of a square surface area of the "Ventilated Drawing" into sand. Since no sand can leave the sandbox, the only viable method for shaping sand is by displacement of sand within the cubic area of the sandbox. Sand is scooped, molded, shifted, compressed, stacked, sloped, scored, and smoothed. In the criticism of the work a descriptive vocabulary of surface is developed around techniques of displacement, qualities of texture, and inherent alignments. Again, surfaces are nothing more than visual manifestations of form; not thick and physical crusts of difference, but a privileged and "superficial" position in space.

- *The Silhouette Section Exercise (figure 5)*

The focus in this exercise is on mapping and analyzing the surface in two-dimensions. Two basic ways to consider and measure the surface of a form are through Geometry (radius, inflection angle) and through Topography (matrix, interpolation, and slope). The student is challenged to discover ways to map their surface through a set of longitudinal and cross-section drawings. The resultant drawings are opaque and binary representations of unseen views in the work rather than simply recording the visible plan view from which the work is executed. The revealed sections work as "Proofs" for the "Surfacing Exercise." When completed the "Silhouette Sections" are used as analytical tools for evaluating the surface and informing further ad-

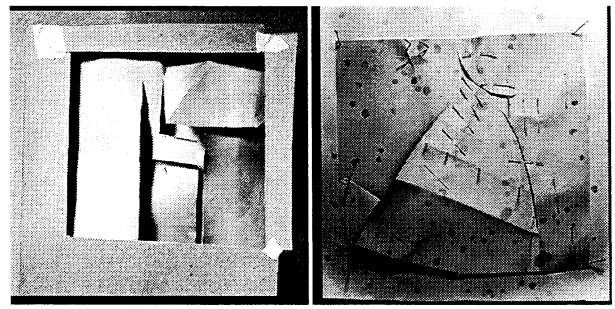

Fig 3. Ventilated drawings, Fall 1999.

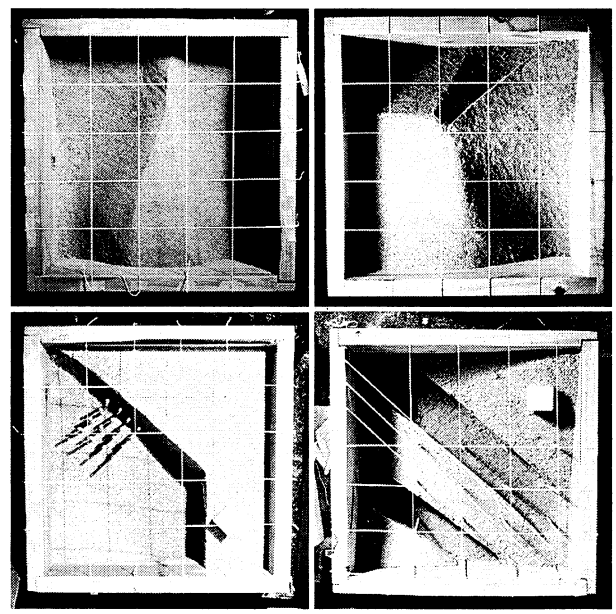

Fig 4. Progress Photos, Fall 1999.

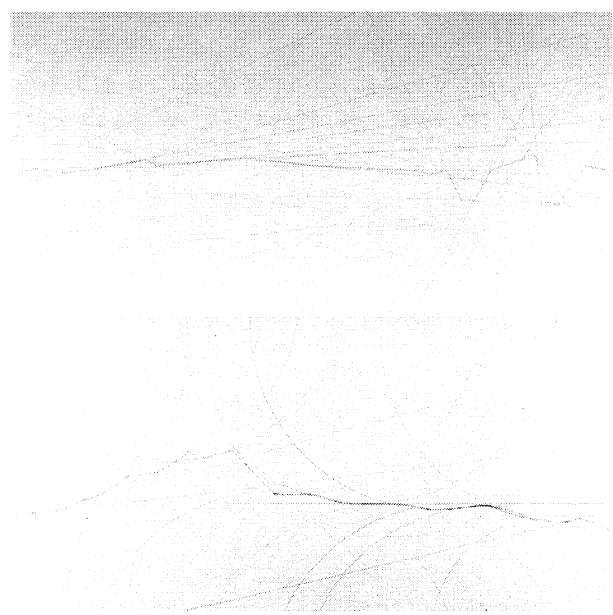

Fig 5. Regulating line drawing, Fall 1999.

justments of the displacement of the sand. Questions raised in the execution of this exercise are:

What is the minimum description of a three-dimensional object?
What is a two-dimensional description of a surface?
Outline, Edge, Section
What are techniques for mapping the profile of your surface onto a plane that passes through the sandbox?

• *The Field / Surface Exercise*

As formal design abilities in manipulating and criticism of the space and surface of the box begin to evolve, the second week of the rotation focuses on the addition of discrete elements and their ability to effect the sand. The first of these two exercises introduces fields and their requisite surfaces. Fields too are quasi-three dimensional elements, acting almost like a uniformly thickened type of surface. The field element has an inherent "center and periphery"[7] sort of radial effect. The concepts of axes and alignments are induced by this condition and become the primary vehicle for evaluation in this exercise. Students are asked to develop a criticism of the surface in their placement of the elements, modification of the surface, and enhancements of axiality and alignment in the space of the sandbox. Questions raised in this exercise are:

What makes a field of things?
Seriality, Uniformity, Evenness, Density
What is an axis?

Linear Void Space, Directional, Terminal Points (receivers), Defined or Contained,

The "Silhouette Section" exercise is repeated for the "Proofing" (mapping and analysis) of this exercise as a conclusion and preparation for the next exercise.

• *The Object / Surface Exercise*

The elements introduced in this exercise are more discrete and interactive with the sand surface than in the last exercise. Planes can slice, cut, retain, and divide. Cubics can be above, on, in, of, or under the surface. This reinforces and focuses the design on a "thicker" spatial thinking than linear axes and alignments along the surface. These sorts of strategies of placement entail a more complete understanding of solid space / void space form making. Both solid space and void space are important in the placement of objects in space. Solid and Void are both conditions of space. Sandbox configurations are evaluated according to the following conditions:

the layout's ability to control the surface of the sand with the objects,
the way that each of the objects relates to and modifies the sand surface,
and the qualities of space that the combination of the solids and the surface generates.

Specific conditions of this combination that will be considered are:

Hierarchy (conditions of dominance and recession), Jointure (considerations of proximity between solids, voids, the surface, and compound elements), and Economy of Means (considerations of doing the most with the least: ecological).

The "Silhouette Section" exercise is repeated for the "Proofing" (mapping and analysis) of this exercise as a conclusion and preparation for the next exercise.

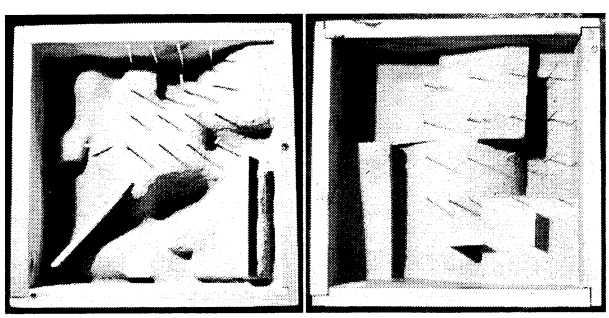

Fig 6. Radical reconstructions, Fall 1999.

• *The Radical Reconstruction Exercise (figure 6)*

The final week of the rotation is spent introducing a more process-based line of thinking. The two previous exercises have begun with a given surface and a discrete palette of elements and composed these so as to exhibit a set of formal concepts such as axis or articulated void space. Techniques for accomplishing these formal concepts include jointure (both between spaces and between elements), hierarchy, termination, definition, containment, and economy of means. The process in the previous exercises proceeded from introduction of a visual idea directly to manipulation of form in three-dimensional space. In this final exercise the focus is on creating relationships between surfaces, forms, and spaces not through willful compositions but by collaging and "willful chance."

The sectional "Proofs" generated over the last three assignments are photocopied and reduced onto clear acetate sheets. They are inverted and arranged in three dimensions so that a rough "Section Collection" sketch (figure 7) of a new configuration for the sandbox. Specifically, in this exercise the student makes adjustments:

of the surface,
between elements and the surface,
between elements,
relative to axiality,
and the void space / solid space relationships
so that the arrangements intensify in a designed condition.

Questions faced in the making are:

How does one coax the 3rd dimension out of 2 dimensions in a sophisticated and inventive way?
Is there anything between 2 and 3 dimensions?
Thick 2-D (Purism)
Compressions & Silhouettes (Balinese shadow theaters)
Ventilated drawings (Cubism)
Collage / Montage (grafting, sampling, and naming)

The final efforts of the rotation are a set of "Proofs" (figure 8) that includes a plan section cut 5 inches from the bottom of the sand. The final drawing of the rotation is the student's first effort to abstract the sandbox planimetrically.

Conclusion

The Form Rotation Unit has three distinct periods of making and reflection:
a) Simple Surface Identification and Manipulation
b) Element and Surface Identification and Manipulation
c) Identified Surface and Element Generation

It should seem that this kind of education should be beneficial for both kinds of students outlined early on in this paper. For the traditional "professional-track" (matriculating) design student it draws out and limits the construction of form to a few highly articulated and "in-between" techniques. For the citizens of "visual culture" in our student population (all of our students, but specifically those who don't matriculate into a professional design responsibility) the Form Rotation Unit attempts to speak to the student in terms that are palpable and familiar by working in familiar but more supple conditions of Form. The outcome of this effort hopefully results in this population of the course being able to read, understand, and manipulate their environment (be it a table setting, a room, a yard, etc.) willfully and with thought.

Architectural studio education rendered to a broader, university-wide, community is an opportunity seldom considered in current curricular discussions. With this Visual Literacy program set up as a freshman learning community in which a third to a half of the annual participants don't matriculate into the design professions let alone into architecture, the studio experience becomes a defacto "liberal arts" course for a portion of the students. Considering this opportunity to teach a broad "cross-disciplinary" student body and faced with the task of condensing an introduction to architectonic and artistic form making into an intensive three-week rotation unit, The Sandbox has been introduced.

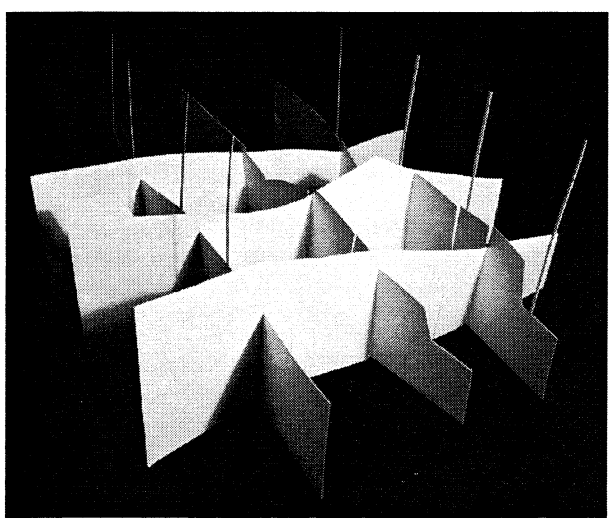

Fig 7. Section collection, Fall 1999.

NOTES

1 At least half of the enrollment in the Visual Literacy course is Pre-Architecture majors (110 students annually) at the outset of first year studies. After two years of matriculation, the Department of Architecture accepts approximately 45 students from the Pre-Arch applicant pool to enter the professional program.

2 Jackson, John Brinkerhoff, "The Love of Horizontal Spaces", *Discovering the Vernacular Landscape* (New Haven and London : Yale University Press, 1984).

3 Isamu Noguchi's work seems to be one oeuvre that particularly develops a hyper-sensitive attention to surface in sculpture, landscape work, and interiors as well as an underlying latent horizontality and scale-ness in whatever he does.

4 A question of interest to this pedagogy is whether there is any potential in focusing on shared paradigms between very common, vernacular, and visually undistinguished formalism and a very rarified, intellectual, and supple codification of visual organization teaching Visual Literacy.

5 Allen, Stan, "Field Conditions", *Points + Lines* (New York: Princeton Architectural, 1999).

6 This technique was a common thread in the pedagogies of most of the author's studio instructors but was developed while teaching closely with Professor Bennett Neiman for a semester.

7 Hejduk, John, "The Nine-Square Grid Problem", *Mask of Medusa* (New York: Rizzoli, 1985).

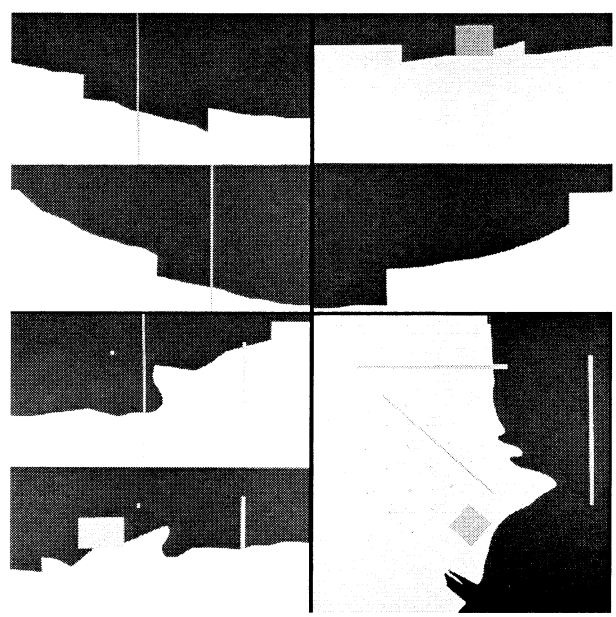

Fig 8. Cut paper drawings, Fall 1999.