RESOURCES FOR MAKING

DALHOUSIE UNIVERSITY

Faculty of Architecture and Planning

COMPUTER
HELP DESK

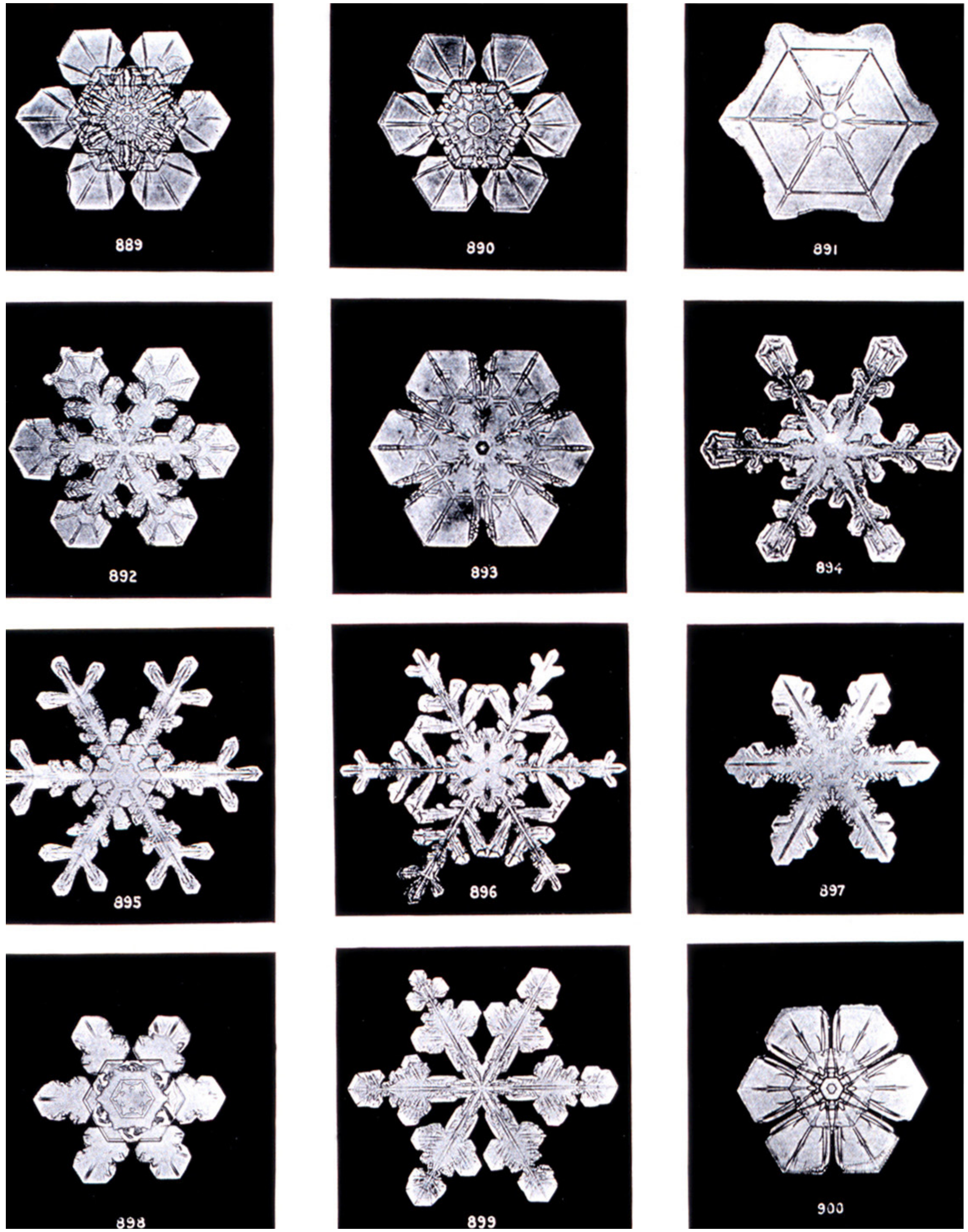
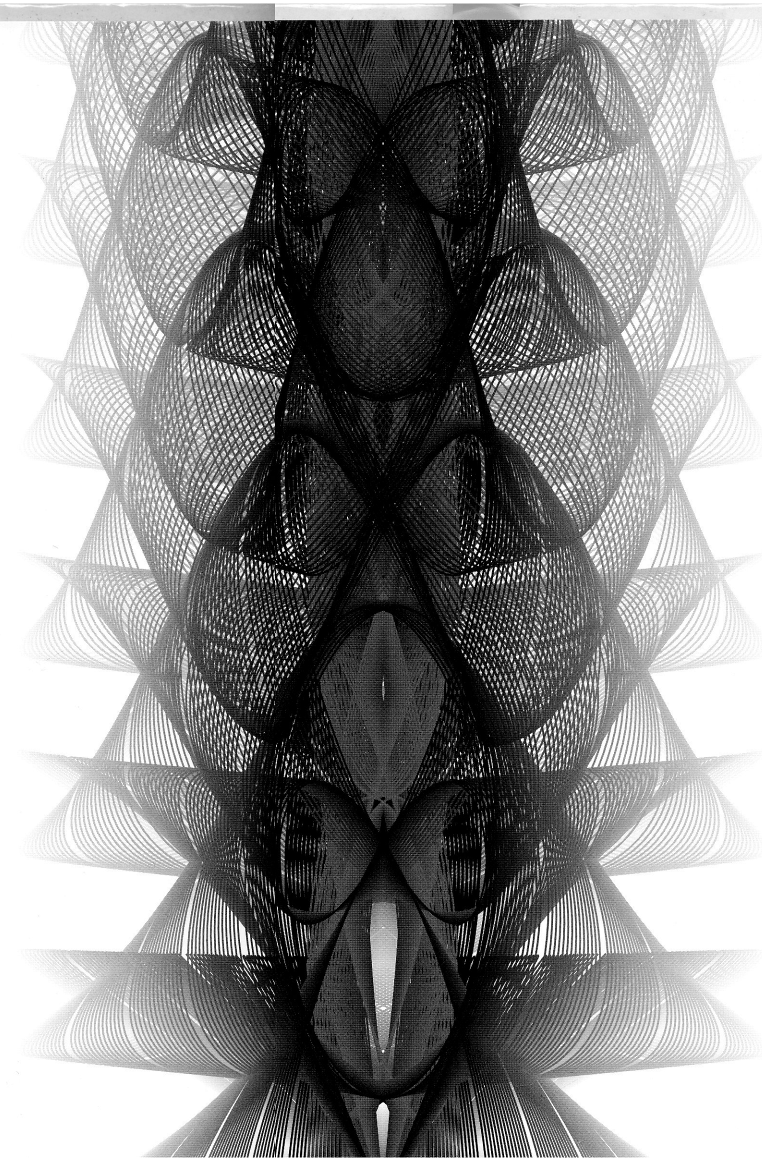
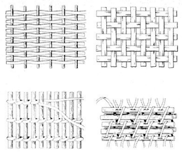


Plate XIX of “Studies among the Snow Crystals ... “ by Wilson Bentley, “The Snowflake Man.” From Annual Summary of the “Monthly Weather Review” for 1902.

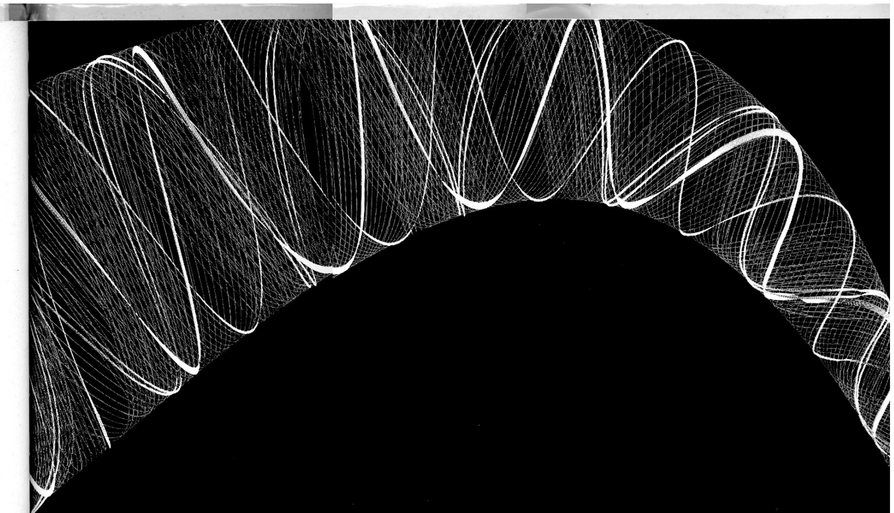
Weaving produces strength by combining two weak systems in a reciprocal pattern.



Aranda/Lasch, from “Tooling,” 2006

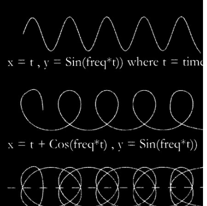


Weaving is the synthesis of two different systems, interlocking in order to give self-supporting form to their combined whole. Traditionally referred to as a "warp" and a "weft" pattern, neither could support themselves alone, but together they become strong. The endless variety of weaving seen in basket, net, rope, and textile design proves that procedural techniques and cultural practices are not mutually exclusive. Most surprising about a woven construction is that it is actually harder to unravel than to weave in the first place.



Recipe for Weaving

1. Start drawing a sin curve: a line that goes around a circle at a steady rate, spread out over time.*
2. Loop the curve by adding a term—a mathematical function, like cos ( )—that speeds up and slows down the line as it goes around the circle.†‡
3. Add more terms to create more loops, overlaps, and squiggles.
4. Mirror the curve for a denser, interlocking figure.§



x = t , y = Sin(freq*t)) where t = time

x = t + Cos(freq*t) , y = Sin(freq*t))

The curve above, mirrored around the X-axis:
x = t + Cos(freq*t) , y = Sin(freq*t))
x = t + Cos(freq*t) , y = -(Sin(freq*t))

---

* The components of the equation are scale, frequency, and amplitude. These mathematical attributes replace the traditional knotmaking procedures of translation, turning, and reflection. Either one of these sets of attributes can produce an endless variety of forms that are traceable back to simple rules.

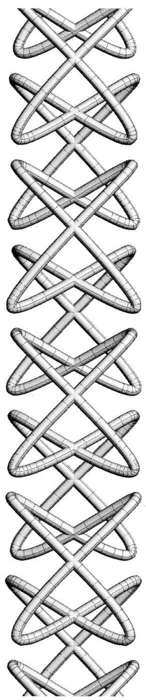
† Adding a cos ( ) term in the x portion of the equation affects the horizontal expansion of the points that make up the curve. The x term pushes or pulls these points along the "time" line (t) until the curve begins to loop back on itself.

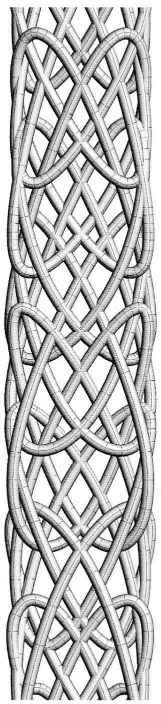
‡ Adding a z term gives a three-dimensional aspect to the curve.

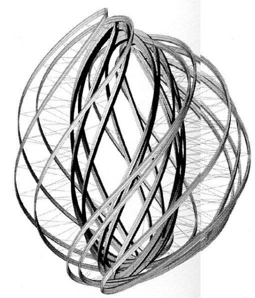
§ Many traditional weaving patterns make use of symmetry because it provides guaranteed points of overlap that help to structure the weave.

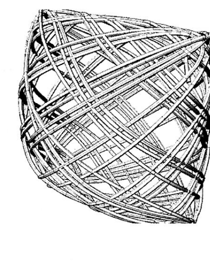
Experiments: Crossing Patterns

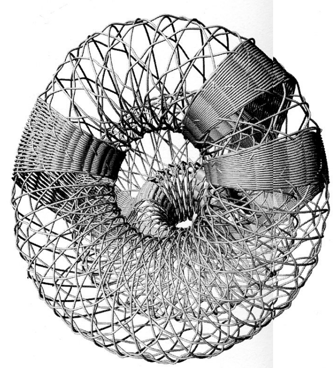
These sketches use a parametric equation to organize a series of sine and cosine curves in space. The weave is a crossing pattern, a "soft" structure of loops and knots wherein the shape of the construction is determined less by the properties of the materials themselves than by the pattern through which two sets of materials interact.

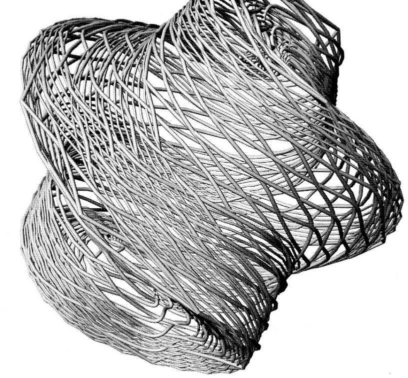












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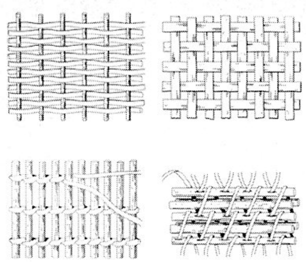

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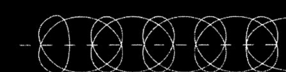

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Computer Aided Design
v
Computation

Theo Jansen, “Animaris Umerus,” Silent Beach, The Netherlands (2009)

Evolution:
https://youtu.be/MYGJ9jrbpvg

Demonstration:
https://youtu.be/5N0IonPOy-I?t=7m44s

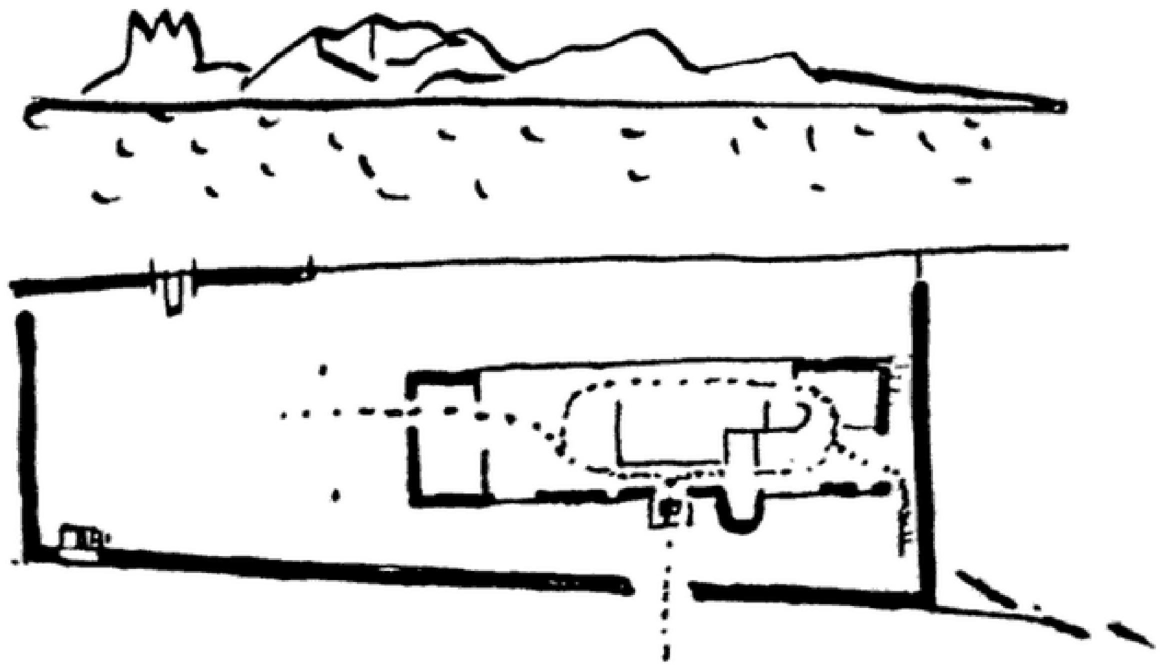
"It started with a **microscope** his mother gave him at age 15 which opened the world of the small to young Wilson. A lover of winter, he made plans to use his microscope to view snowflakes. His initial investigations proved both fascinating and frustrating as he tried to observe the short-lived flakes. So that he could share his discoveries, **he began by sketching** what he saw, accumulating several hundred sketches by his seventeenth birthday. When his father purchased a **camera** for his son, Wilson **combined it with his microscope**, and went on to make his first successful **photomicrograph** of a snow crystal on 15 January 1885.

In addition to the development of the hardware, Bentley also had to **devise a protocol** to capture a snow crystal and transport it with minimal damage to the camera's field of vision. What he found worked best was to capture the crystals on a **cool velvet-covered tray**. Taking care not to melt the crystal with his breathe, he identified a suitable subject and lifted it onto a **pre-cooled slide** with a **thin wood splint from his mother's broom** and nudged it into place with a **turkey feather**. The slide was then carried into his photographic shed and placed under the **microscope**. The back-lit image was focused using **a system of strings and pulleys** he devised to accommodate his **mittened hands**. Once focused, the **sensitized glass plate** — the "film" — was exposed and stored for further processing, development and printing.

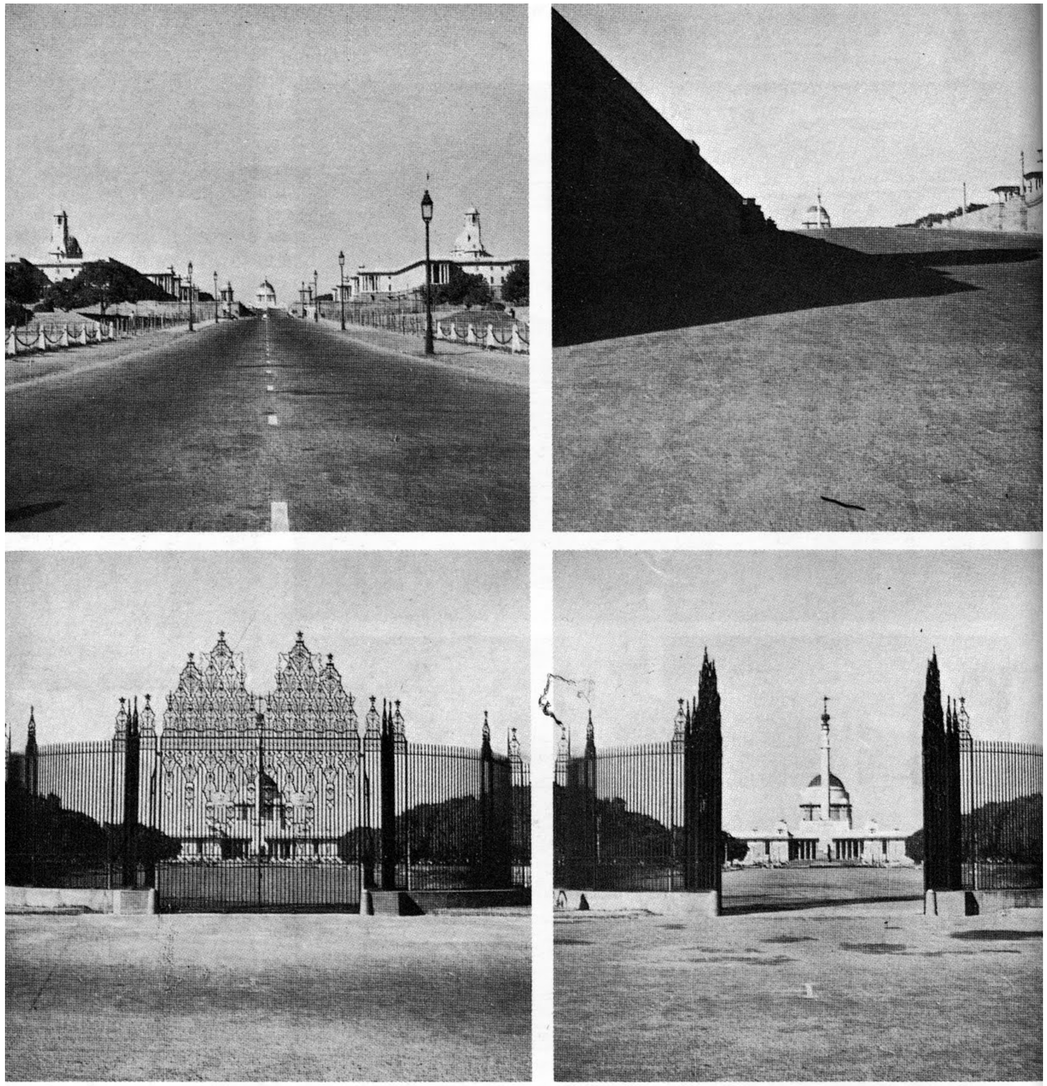
Bentley also devised his own processing methods. In addition to developing the original image, he also created a post-development process to enhance it. Since each photograph was taken of a white snow crystal against a white background, Bentley was dissatisfied with the initial photograph. He felt he could improve the contrast and enhance the detail if he presented the crystal against a dark background. To do this, he painstakingly scraped away the dark emulsion surrounding the snow crystal image from **a duplicate of the original negative** using a **sharp penknife** and **steady hand**. The altered image was then carefully placed upon a **clear glass plate** and then printed, giving it a dark background. Even after years of practice, this post-production process **often took as long as four hours** for a complex snow crystal.

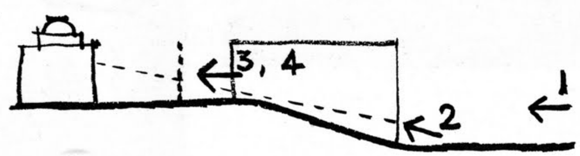
Keith C. Heidorn, "The Snowflake Man of Vermont," The Public Domain Review, https://publicdomainreview.org/2011/02/14/the-snowflake-man-of-vermont/

HOW WE MAKE



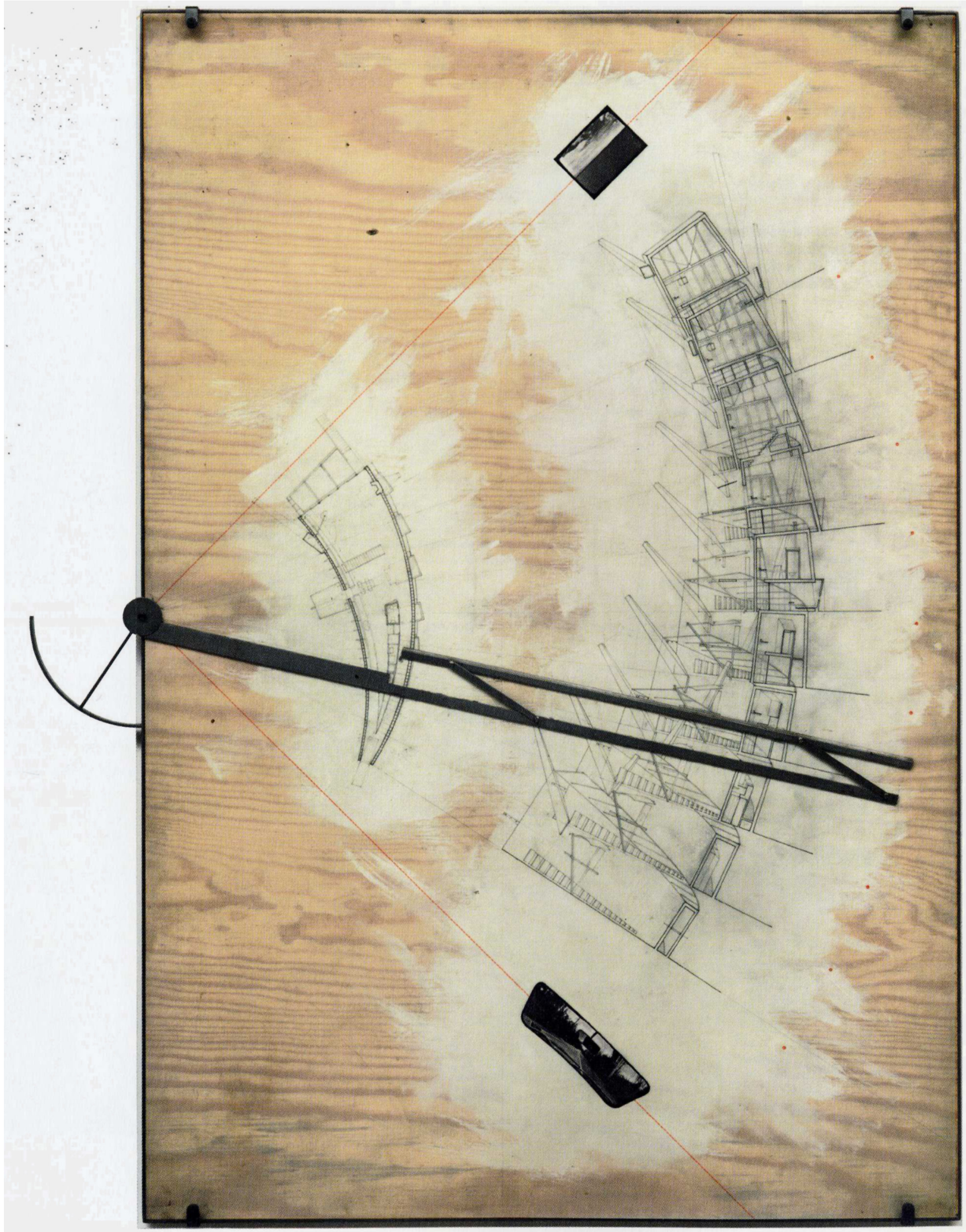
Le Corbusier, sketch of Le Lac, 1954





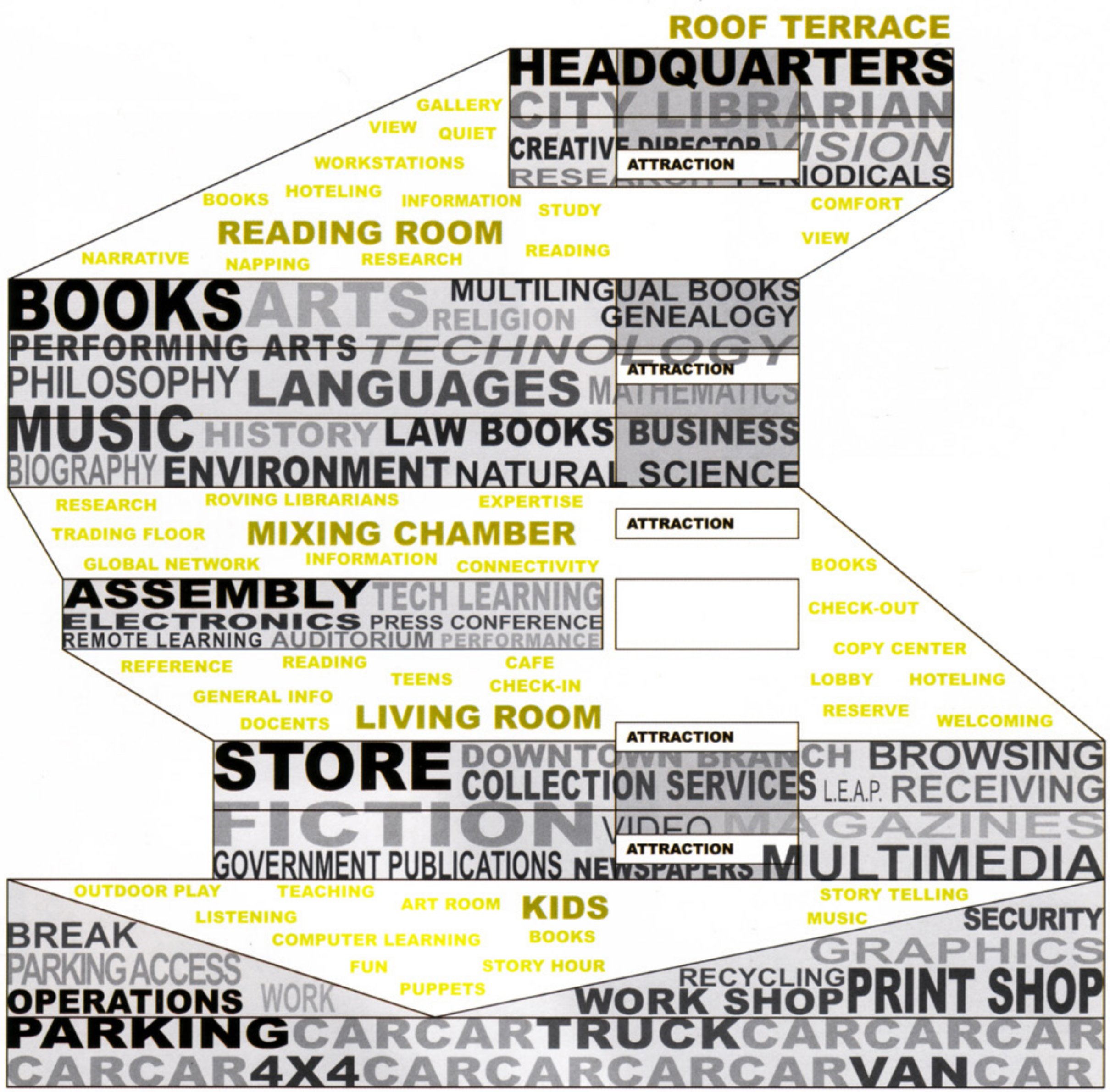
The sequence in New Delhi (read the photographs from left to right) emphasizes the role of levels and screening in serial vision, for here what could simply have been one picture reproduced four times, each view enlarging the centre of the previous view and bringing us near to the terminal building, turns out to be four separate and unique views (see description in the Introduction).

Gordon Cullen, from “The Concise Townscape,” 1961



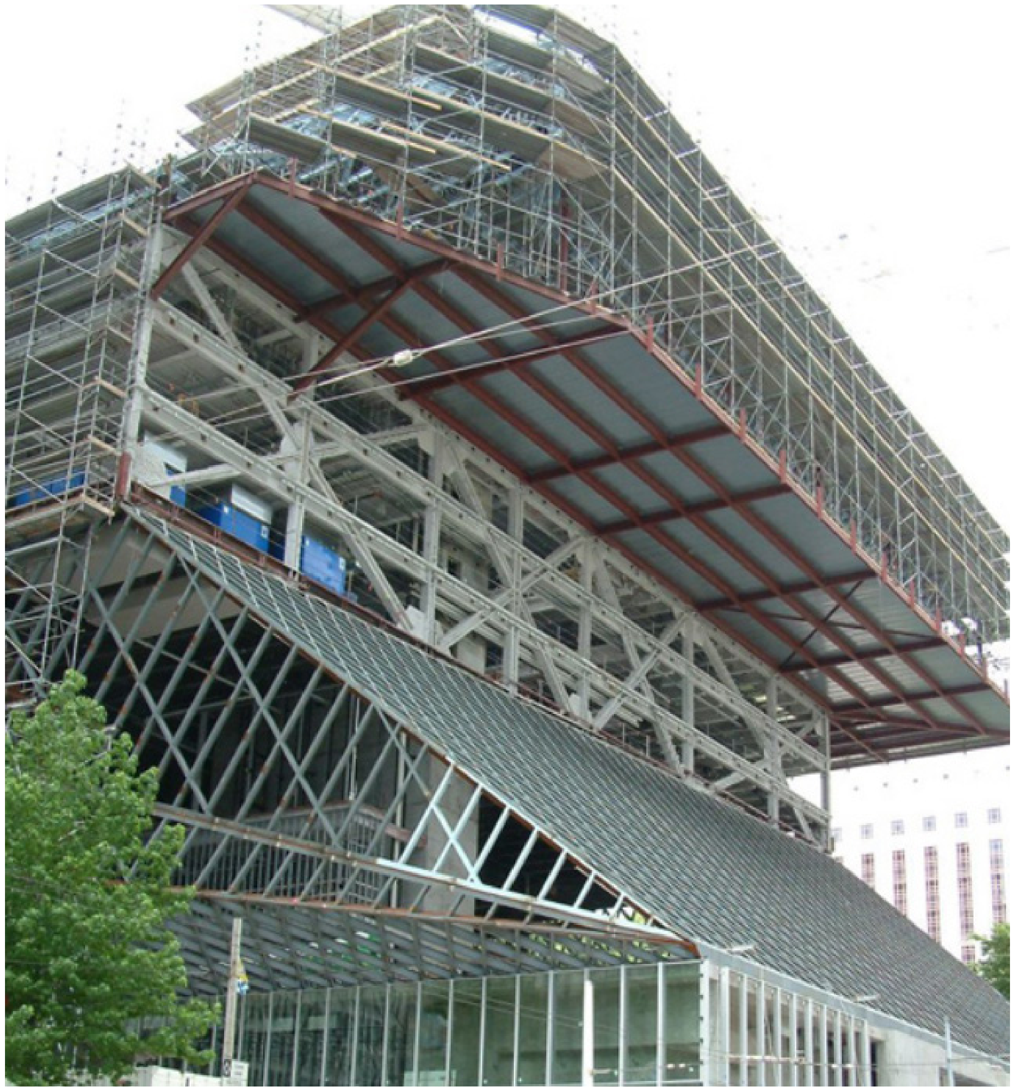
Diller and Scofidio, “Slow House,” North Haven, New York. Plan of lower level and sections. 1989. Electronic print on frosted polymer sheet with graphite and color ink mounted on painted wood with metal.

Buildings are complex social ...



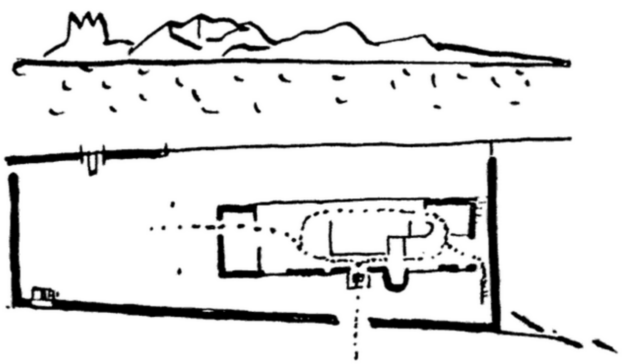
OMA, Seattle Public Library, Seattle, WA, 2004. Program diagram.

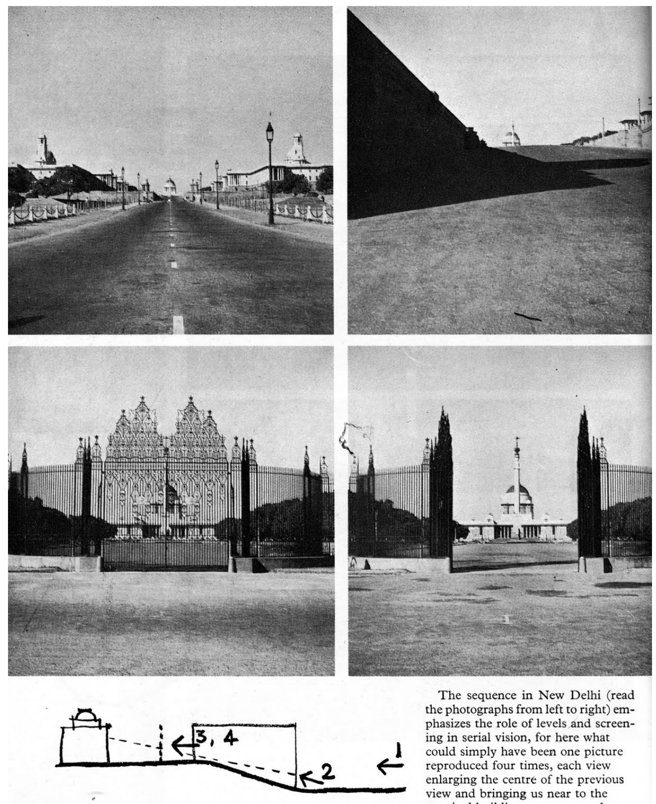
... and material constructions ...



OMA, Seattle Public Library, Seattle, WA, 2004. Construction photo.

... and so require a variety of methods and points of view ...





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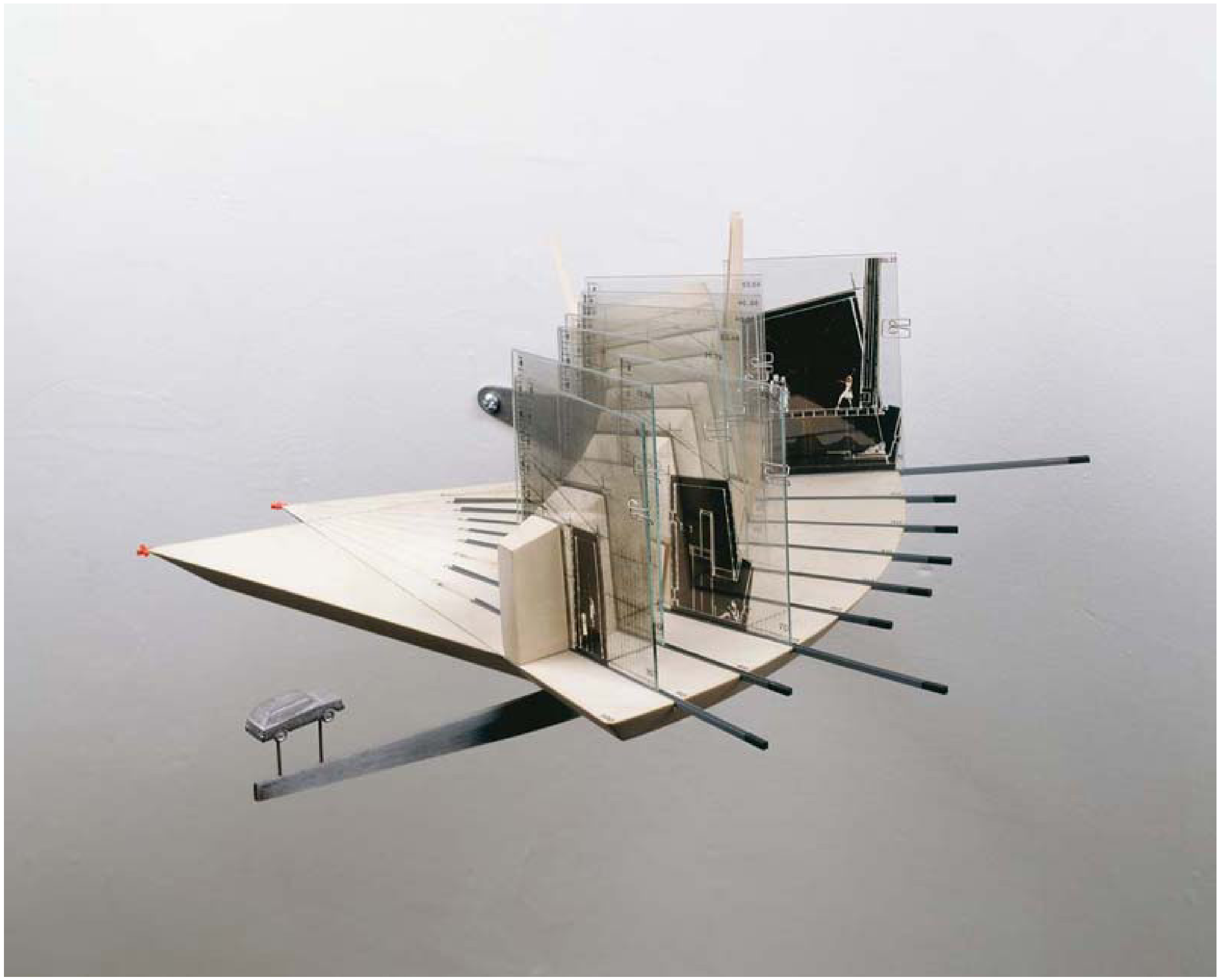
... and strategies for relating them.



Diller and Scofidio, “Slow House,” North Haven, New York. Model. 1989.

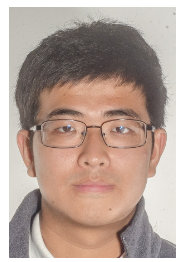
RESOURCES
FOR
MAKING

DALHOUSIE
UNIVERSITY

Faculty of Architecture and Planning

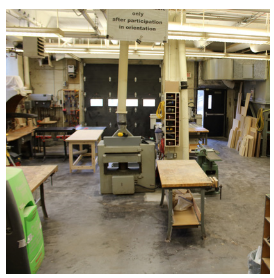
TOOLS & PEOPLE





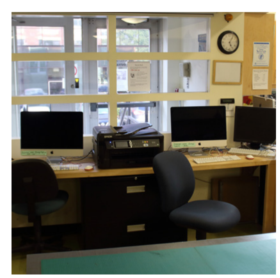




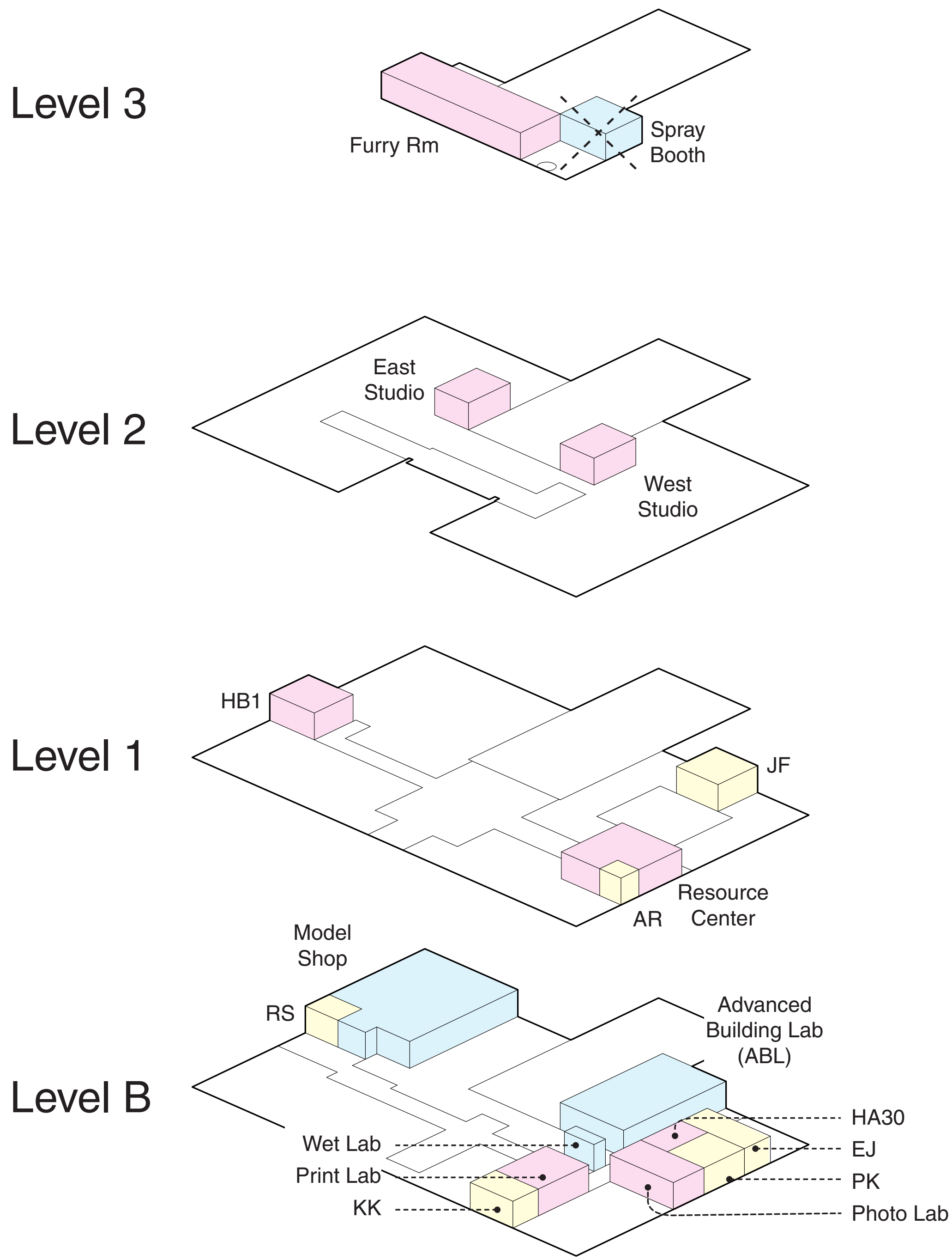






SPACE: REAL



	James Forren (JF)	Emanuel Jannasch (EJ)	Ken Kam (KK)	Patrick Kelly (PK)	Anita Regan (AR)	Regan Southcott (RS)
MATERIAL						
CNC						
3-Axis Mill	•		•			
Laser Cutter 01 (Gray)		•	•			
Laser Cutter 02 (Yellow)		•	•			
3D Printer			•			
Hand + Machine						
Metal Working		•				
Wood Working						•
Wet Lab	•					
Spray Hood			•			•
Foam Cutter	•					
GRAPHIC AND VIRTUAL						
Workstations						
MAC				•		
PC				•		
Printers						
Student Laser Printers				•		
Print Lab Printers/Plotters			•			
Scanners						
Resource Center Scanner				•	•	
Print Lab Scanner			•			
Photo Lab			•			

SPACE: VIRTUAL

[What's Inside the Building]

[Computer Labs]
[Advanced Building Lab]
[Digital Printing]
[Image Collection and GIS]
[Design Software Tutorials]

TIME

UPCOMING
WORKSHOPS:

MODEL-MAKING
MODEL SHOP
DIGITAL FILES

TOOLS

FOR

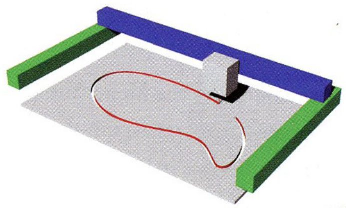
MATERIAL MAKING

DIGITAL

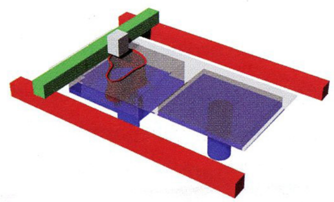
MACHINE + HAND

DIGITAL TOOLS
(ABL & MODEL SHOP)

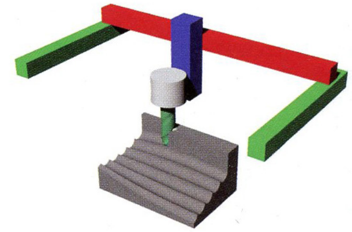
Laser Engraver (Cutter)



3D Printer



3-Axis CNC Mill



Laser Cutter 01 (ABL)

3D Printer 01 (ABL)

(Model Shop)

Laser Cutter 02 (ABL)

Laser Cutter Tutorial

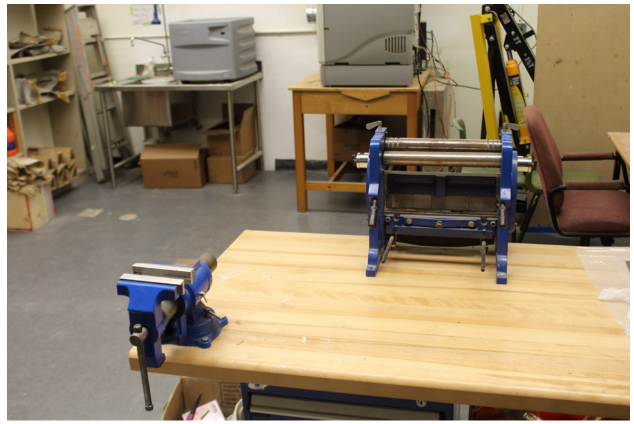
3D Printer 02 (ABL)

CNC 2D Tutorial

CNC 3D Tutorial
(in-progress)

HAND + MACHINE TOOLS
(ABL, Model Shop, & Wet Lab)

Metal Working, Ram Press (ABL)



Metal Working (ABL)

Model Shop

Spray Hood (ABL)

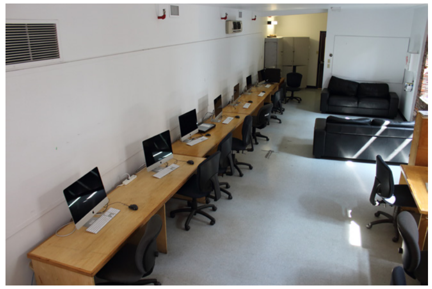
Foam Cutter (ABL)

Wet Lab

TOOLS FOR
GRAPHIC
+
VIRTUAL MAKING

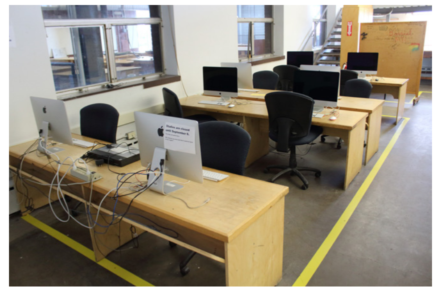
WORK STATIONS
PRINTERS
SCANNERS

WORK STATIONS, PRINTERS, SCANNERS
(Computer Labs, Resource Center, Print Lab, and Photo Lab)


Furry Room

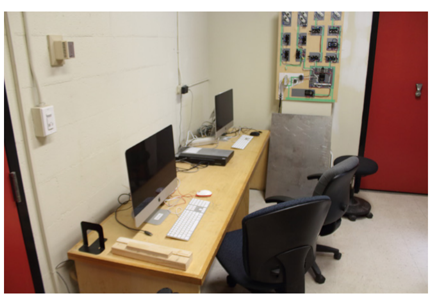

Furry Room PC


East Studio


West Studio


HB1


Resource Center


HA30


Print Lab


Photo Lab

PEOPLE

FACULTY AND STAFF
TEACHING ASSISTANTS

FACULTY AND STAFF

James Forren
ABL, CNC, Wet Lab
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Patrick Kelly
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TEACHING ASSISTANTS

Tech Team

Material: 3D CNC Mill, Laser Cutter, Foam Cutter, Wet Lab

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