

Poetics and Digital Tools

by Bennett Neiman

Simultaneous grasp is creative performance-seeing, feeling and thinking in relationship and not as a series of isolated phenomena. It instantaneously integrates and transmutes single elements into a coherent whole. This is valid for physical vision as well as for the abstract.

Moholy-Nagy 1965

The work discussed is from two sources, the first, an architectural studies seminar entitled, *The Poetic Potential of Computers*, and the second, an advanced topical studio entitled, *A Building which Exhibits Itself*. Earlier versions of the methodologies received the AIA Education Honors Award in 1994 and 1998. Over a 20-year period, the general philosophy of the approach has remained constant. Previous works, "Between Digital & Analog Civilizations: The Spatial Manipulation Media Workshop" (Neiman and Bermudez 1997) and "Digital Media and the Language of Vision" (Neiman and Do 1999), discuss at length the poetic aspects of integrating digital tools into design making. This article is an update on recent developments and a visual presentation of the results.

The pedagogy has shifted from an overt analog-digital migration to more of a digital-digital interoperability. The process usually starts in the analog, but it is quickly translated to the digital, where new media objects that are generated in one program are analyzed, broken apart and put back together in unique combinations. This data is freely exported and imported into other programs where throughout the process the data objects are rearranged, manipulated, transcoded and transformed (Manovich 2001).

Attempting to explain every nuance of this method is impossible. It has many beginnings and paths for jump starting and directing students' creativity. The exercises have varied over the years so that it does not become a static formula or dogma. The mystery of the approach is a part of the game of discovery. The crafting of the various design exercises does not in itself guarantee successful results. Continual criticism of student work, using contrast and comparison throughout the process, is a key aspect to this

approach. Early phases of the studio or seminar feature a structured set of exercises where specific techniques or media are required. In the later phases, students are free to decide on their own, subject to criticism and questioning, what tools and techniques are best. As new media technologies evolve, other trajectories and combinations are possible. As each new group of students engage the exercises, new ideas and understandings are applied to the pedagogy for future groups. The quality of the tools as well as the teaching and the work itself is advancing. Thus, this is an evolving dynamic process for both the teacher and the students.

CREATIVE METHODOLOGIES

For *The Poetic Potential of Computers* design seminar, the initial exercise, an analog space-light-motion box, is constructed according to ideas described in "Vision in Motion" (Moholy-Nagy 1965). Interesting material combinations and ways of creating movement and interchangeability are sought. The design methodology emphasizes experiential and sensorial perception enabling the study of form, space, material, light, shadow, color, transparency, translucency, texture, and motion (Neiman and Do 1999). Using a digital camera or digital video, unexpected images and spatially provocative viewpoints are captured from the space-light-motion box. Out of the many possibilities captured, several unique shots are evaluated according to Moholy-Nagy's eight varieties of photographic vision which are described as abstract, exact, rapid, slow, intensified, penetrative, simultaneous, and distorted seeing (Figures 1-4).

The digital schemas exercise is based on Wassily Kandinsky's analytical drawing methods (Poling 1986). Using vector-based software (Adobe Illustrator) a series of analytical diagrams (orthogonal, rotational, tension, and figural schemata) examine the hidden underlying geometries of selected space-light-motion box captures. In this exercise, the architectonic potential embedded in the schemas is emphasized (Figures 5, 6).

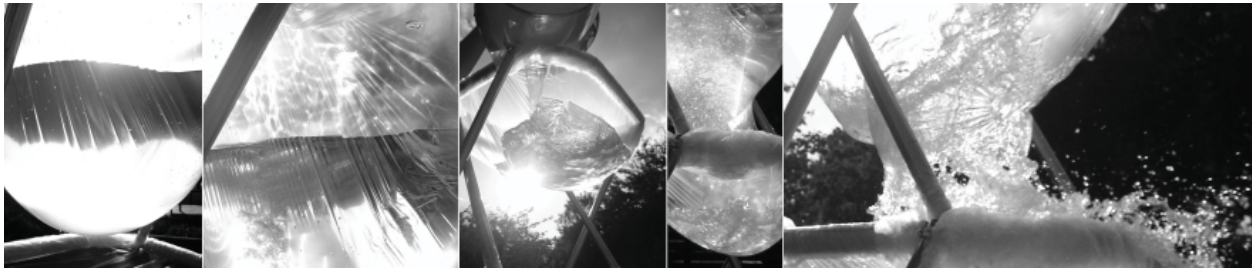


Figure 1: Mary Lopez and Josie Shaw: analog space-light-motion box captures - frozen gravity, tension, elasticity, explosion.



Figure 2: Justin Rice and Darell Westcott: analog space-light-motion box captures - delayed projection; the engagement and interaction within a set environment.



Figure 3: Jeff Nesbit and Filemon Aragon: analog space-light-motion box captures - rotary filtration apparatus.



Figure 4: Sarah Smith and Justin Webb: analog space-light-motion box captures - metal, contort, torque, bind, pull, stress, strain reflected, refracted.

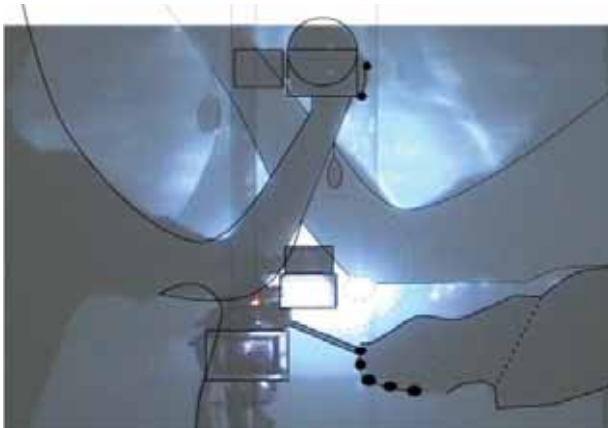


Figure 5: Justin Rice: digital schemas - figural.

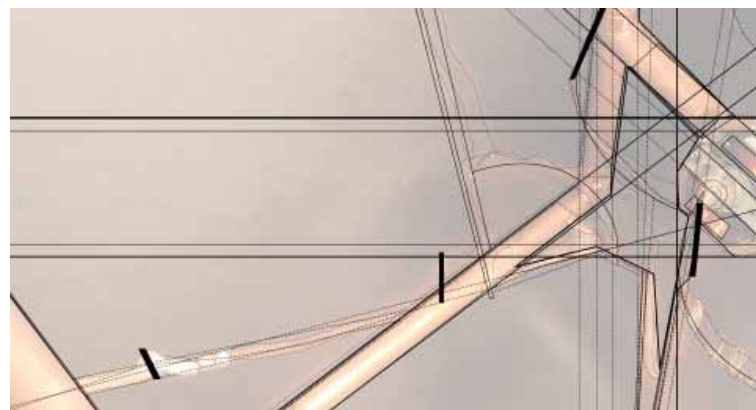
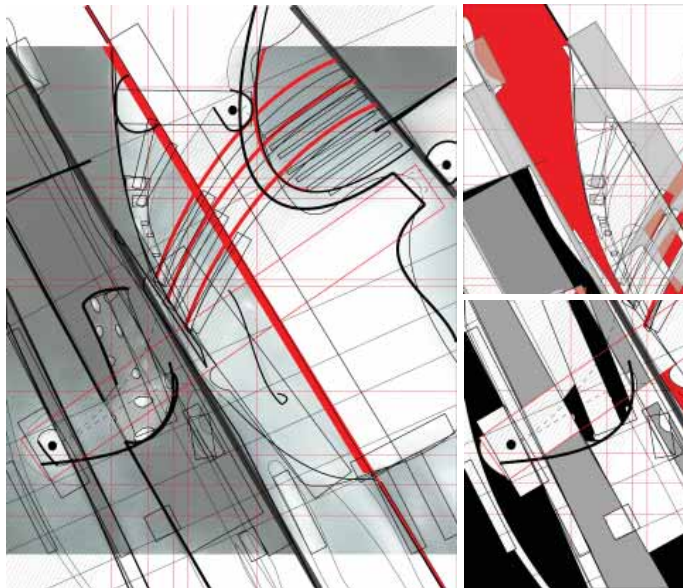


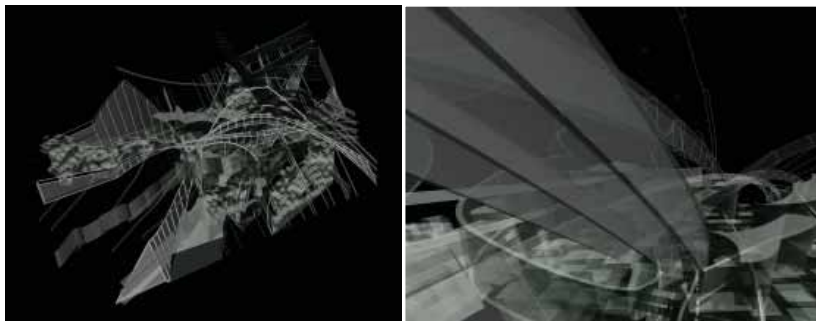
Figure 6: Jack Mussett: digital schemas - combinations of orthogonal, rotational, tension and figural.

Digital templates combine different layers from the source digital schema set. Using Adobe Illustrator's Live Paint operations, selected regions and lines are filled with different colors representing subliminal systems, sometimes metaphoric, other times organizational. Principles derived from the schemas are used as a guide. In this exercise, design is the selective expansion of formal possibilities, through additive and subtractive processes (Figures 7-9).



Figures 7, 8, 9: Jeff Nesbit: digital templates; schema layer combinations enhanced with Live Paint.

Using **form•Z**, the flat two-dimensional shapes of the digital schemas and templates are projected into digital relief models consisting of solids, voids, projections, depressions, and deformations of positive and negative space. The diagrams can suggest rotation, tension, compression, warping, bending, or smooth height translations. In this exercise, design is a transitional study between two-dimensional and three-dimensional worlds (Figures 10-13).

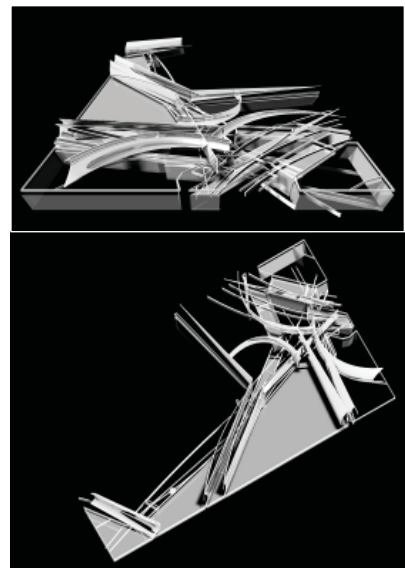


Figures 10, 11: Josie Shaw: digital relief.

Once three-dimensional digital objects are created, their locations, number, and scale can be reconsidered within **form•Z** space. The digital space modulator consists of duplicated elements and freely arranged combinations of the digital reliefs. In this exercise, design is the interpretive arrangement and composition of objects in three-dimensional space. (Figures 14-17).

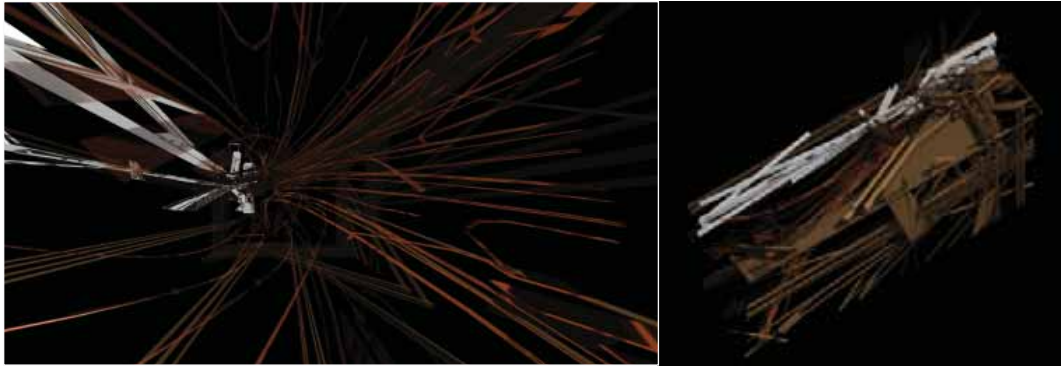
Spatially provocative views exploring the sequential possibilities of framing graphic space are discovered and recorded. This is thought of as a spatial narrative from outside to inside to outside. As in the analog space-light-motion box, Moholy-Nagy's eight varieties of photographic vision are applied as a guide. These digital paintings should exude the spirit of the original digital captures with mood, tonality, texture, lighting effects, color, and general organization. For the digital space display, Adobe Photoshop is used to enhance, adjust, crop, reframe, overlay, warp, and distort individual or combined digital paintings. A variety of painterly techniques in Zaha Hadid's work are suggested, such as: color modulations; gradients of dark to light; dissolving objects into their background; x-ray layering; multi-perspective projection, multiple distortions, fragmentation and deformation; magnetic field space; particle space; and continuously distorted space (Schumacher 2004). In this exercise, the relationships between the form, light and space of a constructed spatial fantasy must have a conceptual connection to the originating event (Figures 18-27).

The *Building which Exhibits Itself* studio uses similar techniques as in past and present versions of the *Poetic Potential of Computers* seminar. The project exhibits the self-referential process of making, through the exploitation of

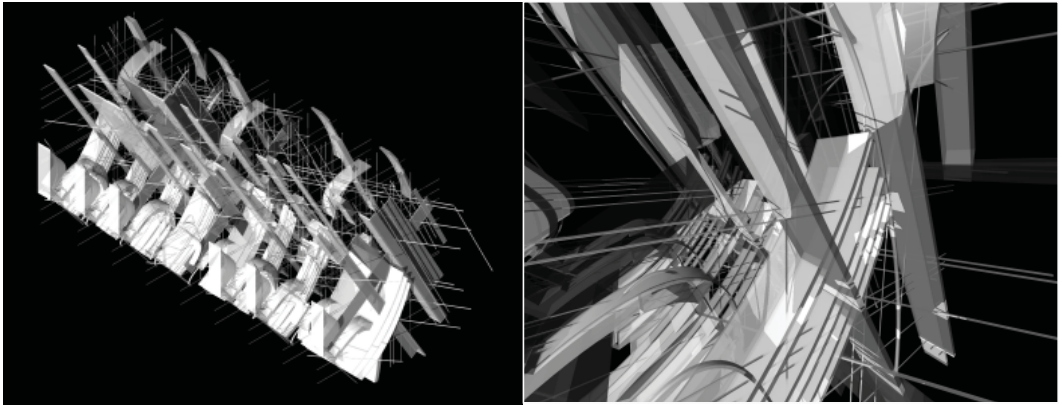


Figures 12, 13: Jack Mussett: digital relief.

Figures 14, 15:
Jack Mussett:
digital space
modulator.



Figures 16, 17:
Jeff Nesbit:
digital
space modulator.



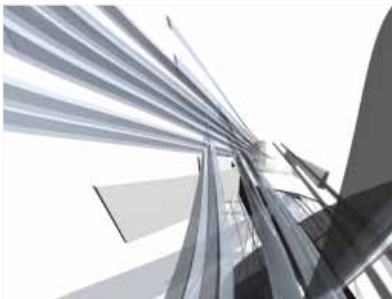
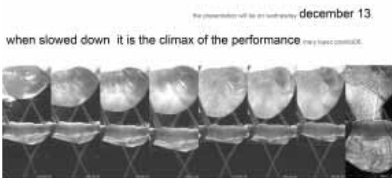
digital design technologies. It is a prototype demonstrating variations of a formal system. The transformations, sequences, variations, and generations are presented as exhibits. Every digital artifact generated during the design process is displayed within the building which exhibits itself.

According to John Hejduk, analysis involves seeing architecture from many different angles "... in this way the complexities and overlays of architectural thought and fact are revealed. The student begins to understand and realize how much really goes into the making of a significant piece of architecture. He dissects the work and reassembles it; ...The analysis problem is one of recreation" (Hejduk 1988).

The process begins with an interpretive analysis that juxtaposes a pair of opposing canonical buildings, in this case from Le Corbusier and Mies van der Rohe. The most emblematic or essential plans and sections are selected. The relationship between plan and section reconstructs the idea of each building. Further analysis separates and extracts the architecture into component part systems such as planes, volumes, solids, voids, horizontal, vertical, columns, walls, piers, curved, rounded, angled, etc. These studies are reassembled into layered combinations of the systems. This is followed by a reverse excavation of the drawings, evoking the essence of the spatial order

inherent in the original structure. A similar process of excavation or sequential removal of material is conducted on interior and exterior photographs of these buildings. Photographic parts from both buildings are selected, exchanged, and recombined into collage variations. Each collage structure must use an analytic plan and section combination as an underlying constant. Individual collage structures are linked as a five-frame linear sequence. The ordering of the frames as well as the transitions between frames are studied. Speculative transverse sections are cut through this continuous labyrinthian structure. There is an intentional de-familiarization from the original object. The result is a poetic reinterpretation of exemplary architecture (see Figures 28-31).

The analytic processes of abstraction condition the synthetic methods for a six-week architectural building project (in this case, a Steel Museum in Pittsburgh that is made of steel). Critical to the project development is the fluid interoperability between softwares. Of particular interest is the ability to take Adobe Illustrator Live Paint elements directly into **form•Z**, allowing for the rapid generation of multiple 3D prototypes. These experimentations are evaluated and adapted according to the circumstances of site and program. The architectural elements, the site, and the sequences of movement through the building which exhibits itself, are all regarded as exhibits (see Figures 32-44).



Figures 18, 19: Mary Lopez: digital paintings - climax of the performance.



Figure 21: Jack Mussett: digital paintings - indefinite creation mechanism.



Figure 20: Amanda Glidewell: digital paintings - constant state of making and unmaking. The work as a constant state of making and unmaking, appearing and disappearing, perpetually alive. Images captured from the motion of the hand. Wires, lights, gloves, all veiled by a screen. Shadows cast, reflections, and blurs of chrono-photographic motion captured in mere nano seconds frozen in time. These contained images, then put into the analog and digital realm, being remade and reconfigured to form new images as a state of constant flux.



Figures 22, 23, 24: Jenny Welton: digital paintings - leash the hands.

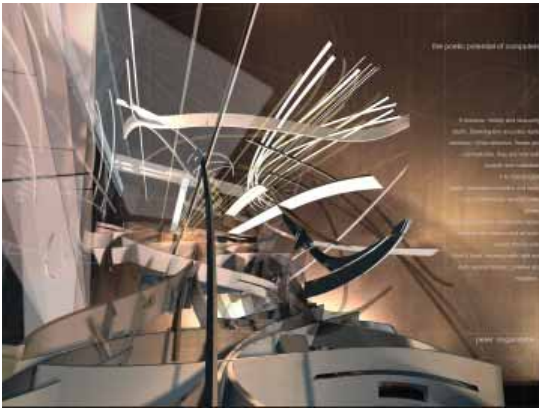


Figure 25: Peter Lingamfelter: digital paintings - a diorama, veiled and obscuring depth.



Figure 26: Justin Rice: digital paintings - auto architect on off. Seen as a stage, the light box project requires interaction among users within a set environment. This engagement is recorded, projected, then re-projected. This perpetual repetition of events is a machine that can create its own architecture. It is the auto-architect. It is designing through non-action by embracing the basic laws of technology.

Figure 27: Sarah Smith: digital paintings - a never-ending completion.

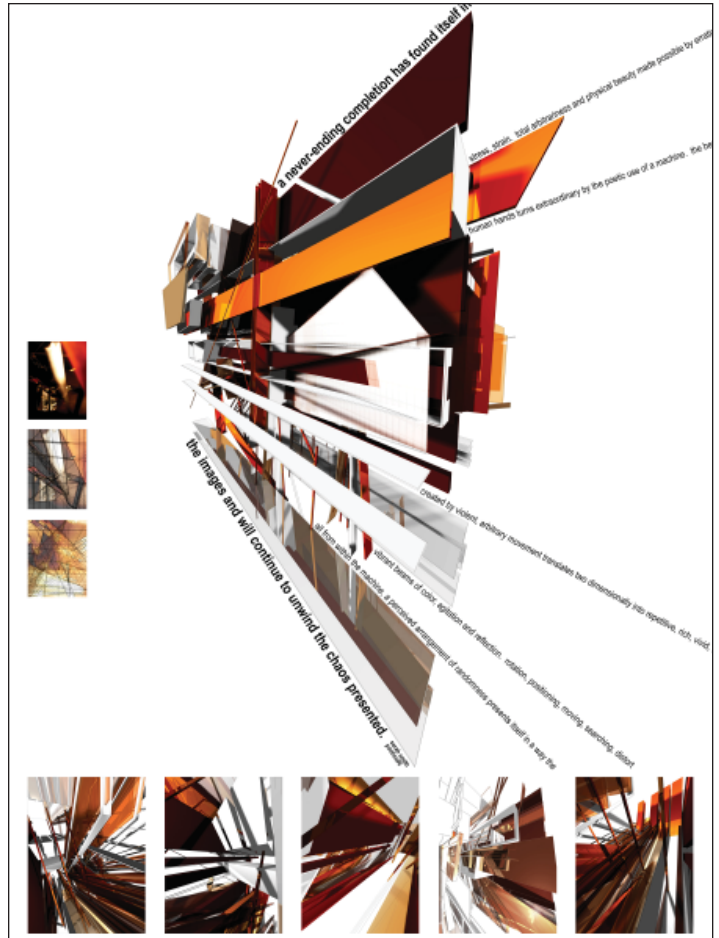


Figure 28: Joe Bloodworth: La Plata vs. Farnsworth interpretive analysis exhibit.



Figure 29: Clay Weiland: Savoye vs. House with Three Courts interpretive analysis exhibit.



Figure 30: Brandon Weinheimer: Brick Country House vs. E1027 interpretive analysis exhibit.



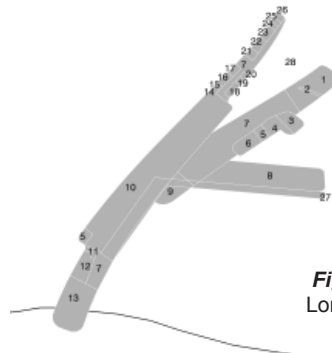
Figure 31: Cole Lorenz: Barcelona Pavilion vs. La Roche-Jeanneret interpretive analysis exhibit.

CONCLUSION

The creative techniques presented give students a procedural foundation for the integrated use of contemporary media in the design process. In both courses, digital tools are used as an interpretive playground for design experimentation. The process unfolds as a series of experimental exercises, each with its own set of interrelated media and time frames. The basic limits are established and the instructor coaches them as they explore. Specified digital tools focus more on being evocative, than on the technicalities. The method is not about being an expert in any specific software, but more about interoperability or the ability to move back and forth fluidly between media. Each course presents a broader application of digital tools that is critical to computational design, especially in the realm of today's media driven world. The methods employed find new paths toward creativity where play and interpretation create an inviting environment for design in the context of contemporary media (Neiman and Bermudez, 1997).

The wide range of results produced in these courses, and the fact that most of these designs would never be attempted by traditional analog methods, demonstrate the power of contemporary media to expand the intellectual horizons of design production. The methodologies deserve credit not only for the concrete results but also for another less measurable outcome: students leave these experiences with a renewed and informed enthusiasm toward the present and future of designing with computers (Neiman and Bermudez, 1997).

Digital tools speed up the designer's ability to create, find, develop, and represent. The many artifacts produced liberate the designer to make choices and set a direction. The cyclical nature of this incremental and additive process, oscillating between various media, allows the designer to create, evaluate, understand and then recreate from previous discoveries. The computer is a complex evolving tool that expedites and reveals a poetic creative process.



Figures 32, 33, 34, 35, 36: Cole Lorenz: Museum of Steel, a steel building which exhibits itself.



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HOT METAL

which exhibits itself

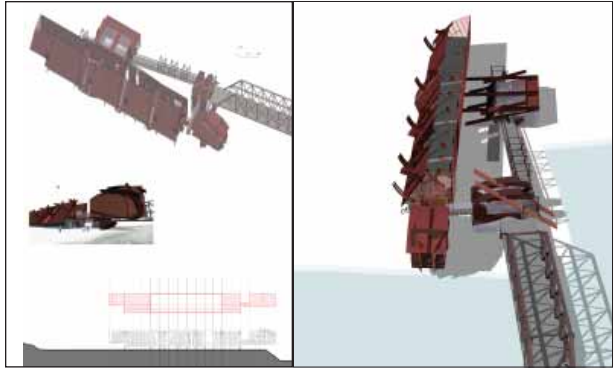
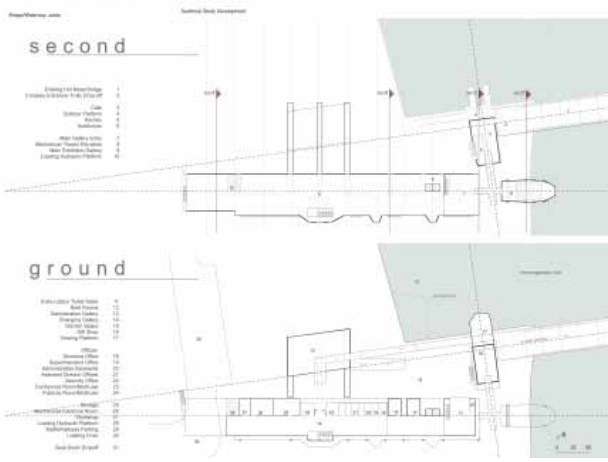
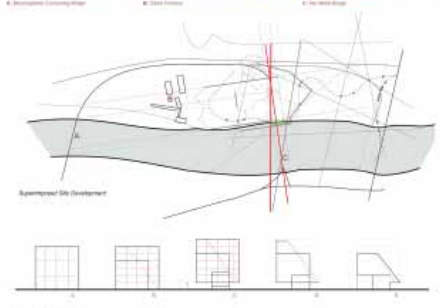
Steel Museum
Ravenna, PA (near Pittsburgh)

Bridge:
HOT METAL is sited as another joint within an already established landscape that draws its meaning and purpose through a series of connections – bridges to banks; rails to roads; rivers to rivers.

Context:
HOT METAL is both the building and the context. Steel is the exhibit. The exhibit is the steel.

Memories:
HOT METAL establishes a visual and literal connection with the abandoned Carrie Furnace. Viewed from within Carrie Furnace, the industrial landscape is one level, decaying. The corrosion of HOT METAL creates a symbiotic relationship between the process of decay and the act of viewing.

Measurement:
Steel exists. HOT METAL's exposed structural elements corrode, simultaneously preserving the landscape's connection to the past as HOT METAL itself continues the process of becoming the past.



Figures 37, 38, 39, 40, 41, 42, 43, 44: Jeff Nesbit: Hot Metal which Exhibits Itself. The Hot Metal museum is another joint within an already established landscape that draws its meaning and purpose through a series of connections – bridges to banks; rails to roads; rivers to rivers. Hot Metal establishes a visual and literal connection with the abandoned Carrie Furnace, an industrial landscape that is inert and decaying. This corrosion creates a symbiotic relationship between the process of decay and the act of viewing. The exposed structural elements corrode, simultaneously preserving the landscape's connection to the past as well as a process of becoming the past.



Bennett Neiman holds a two-year Master of Architecture from Yale and a six-year Bachelor of Architecture from the University of Cincinnati. He taught architectural design at University of Colorado at Denver/Boulder from 1987-2004, earning tenure in 1995. He is currently a tenured Associate Professor at Texas Tech University College of Architecture. Since 1983, Professor Neiman has received several honors for a series of self-generated architectural design projects, competitions, and teaching involving improvisation, order, and variation on a theme. His design workshops, seminars, and studios exploit the strengths of both traditional media and digital technology in design. He received the American Institute of Architects AIA Education Honors Award in 1994 and 1998 for this work. He received the Association of Collegiate Schools of Architecture Faculty Design Award, in 1990 for Surrealistic Landscapes and in 2005-2006 for bebop SPACES. [Photo by Lahib Jaddo.]