

Repetition and the Frame

Jennifer Yoos with Vincent James

*Walking, Walking, Walking, Walking,
Walking, Walking, Walking, Walking,
Walking, Walking, Walking, Walking,
Walking, Walking right hand at chin.*

—Title of the first fourteen plates
Eadweard Muybridge

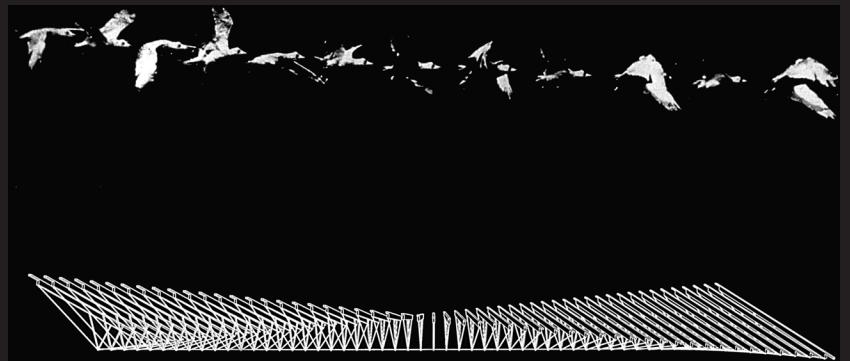
In his studies of animal locomotion, Eadweard Muybridge inadvertently developed the motion picture. By recombining the photographs extracted from life and projecting them in a rapid sequence, he recreated the motion of his subject.¹ For Muybridge, the frame was instrumental in visualizing and recording the complex space of movement, first isolated as frames in time and then recombined into sequential motion.

The standardized architectural use of the frame, however, typically reinforces a two-dimensional, static sense of space. In contrast to other methods of construction (such as casting, molding and stonecutting) which begin with three-dimensional form, contemporary frame construction is assembled sequentially as a set of independent flat plates combined into a structured shell. The resulting complex interior space occurs as a by-product of the process. Whether a frame supports the flat skin of the building or defines an opening through it, the frame relies on the abstract, static qualities of two-dimensional phenomena.

The frame in architecture is used as an editing device. The traditional window frame selectively frames three-dimensional space, suppressing the sense of depth and distance. In a way very similar to painting, the frame is used as a boundary or an aperture to reduce complexity, carefully composing and limiting its contents. The resulting two-dimensional abstraction intensifies compositional relationships, material qualities and the sense of stability.

The art historian Wilhelm Worringer distinguished between art that suppresses the three-dimensional and art that exaggerates it and creates an illusory quality of space. While believing both methods of representation to be valid, he understood that each had distinctly different relationships to reality. Worringer maintained that the suppression of the three-dimensional in art arises from fear and a desire to control seemingly arbitrary phenomena by focusing on a singular object and its qualities.²

Worringer refers to “an immense spiritual dread of space” as the force behind the traditional delimitation of extended space. He supports this premise with the example of Egyptian architecture and its technique of using freestanding columns to regulate open space.³ This suppression of unlimited three-dimensional space serves an underlying desire for architectural control through the use of division and ordering. While the il-



Site plan

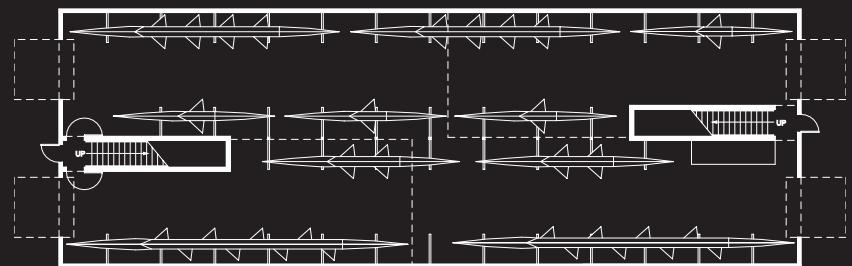
lusion of motion and drift can cause a similar sense of unease, the ambiguity of extended space inspires a deeper fear. Though the predictable ordering of columnar elements is usually relied on to relieve the aesthetic discomfort of structural ambiguity, they are more significant in this example for their clear delineation of spatial boundaries.

On the other hand, Worringer points out that many forms of art exploit the simulacrum of a three-dimensional space and its inevitable ambiguity. A very different aesthetic experience is found in the complexity which encourages the imagination of space beyond what physically exists.⁴ The anticipation of extended space engages the sense of the sublime; the intentional blending of pleasure with unease. Exhilaration is found at the freedom of unbounded space and a sense of wonder in its three dimensional complexity.

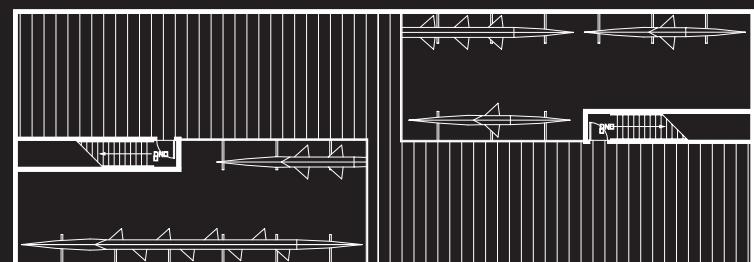
The ability of the architectural frame to act as a series of parts while unifying the whole allows it to shift be-

tween two- and three-dimensional effects. Each variation in a series of geometrical frames creates a more plastic overall form, amplifying the sensual qualities of the three-dimensional. Harnessing the frame for the expression of these qualities of space allows a unique interplay of fixed boundaries with ambiguity, and texture with smoothness. Two- and three-dimensional representation is not necessarily oppositional, but is potentially unified in the device of the frame.

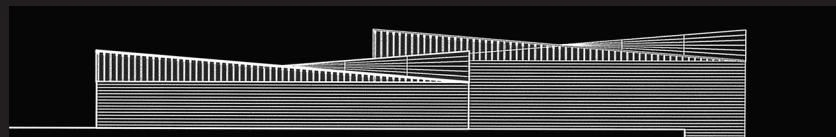
The expressive quality of the frame lies in its ability to define complex three-dimensional spaces while maintaining its essential linear and two-dimensional qualities. The Minneapolis Rowing Club combines these two senses of space in an attempt to achieve a balance between architectural stability and motion. Through a series of techniques, the Minneapolis Rowing Club tests how the use of a simple frame and its rhythms could act to amplify the perception of movement and a sense of three-dimensional extended space.



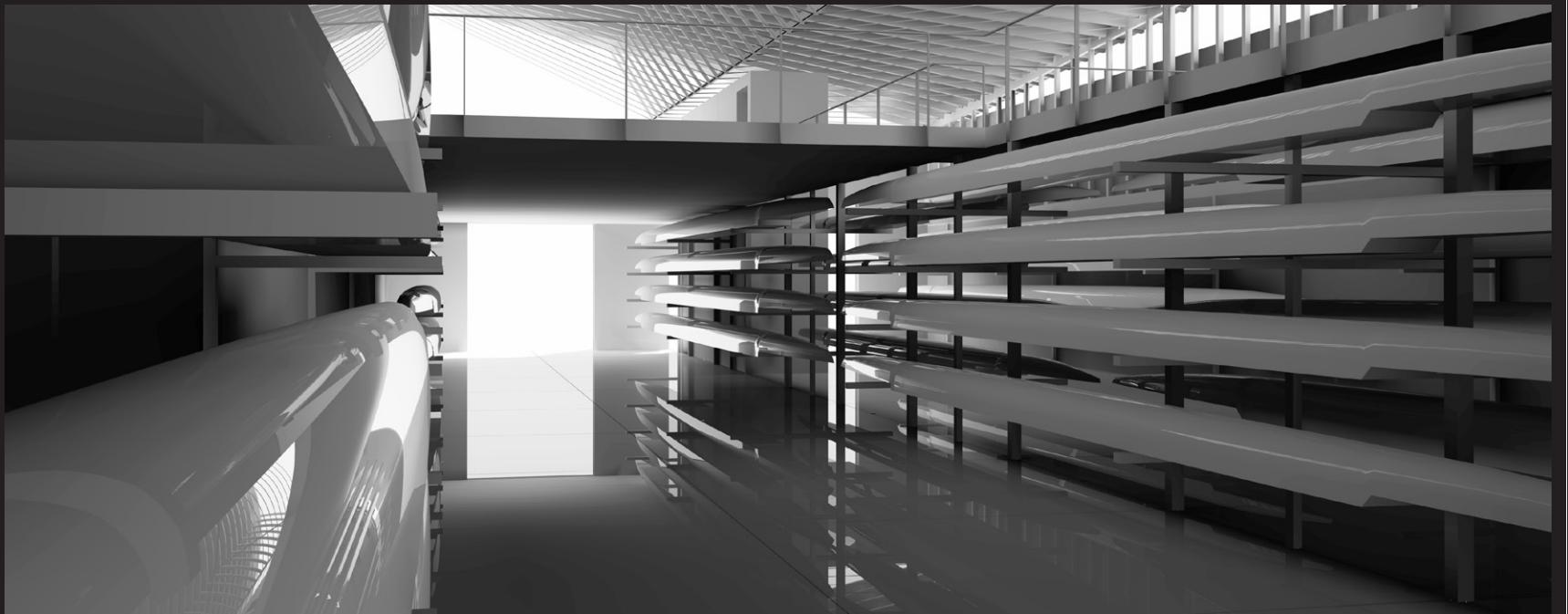
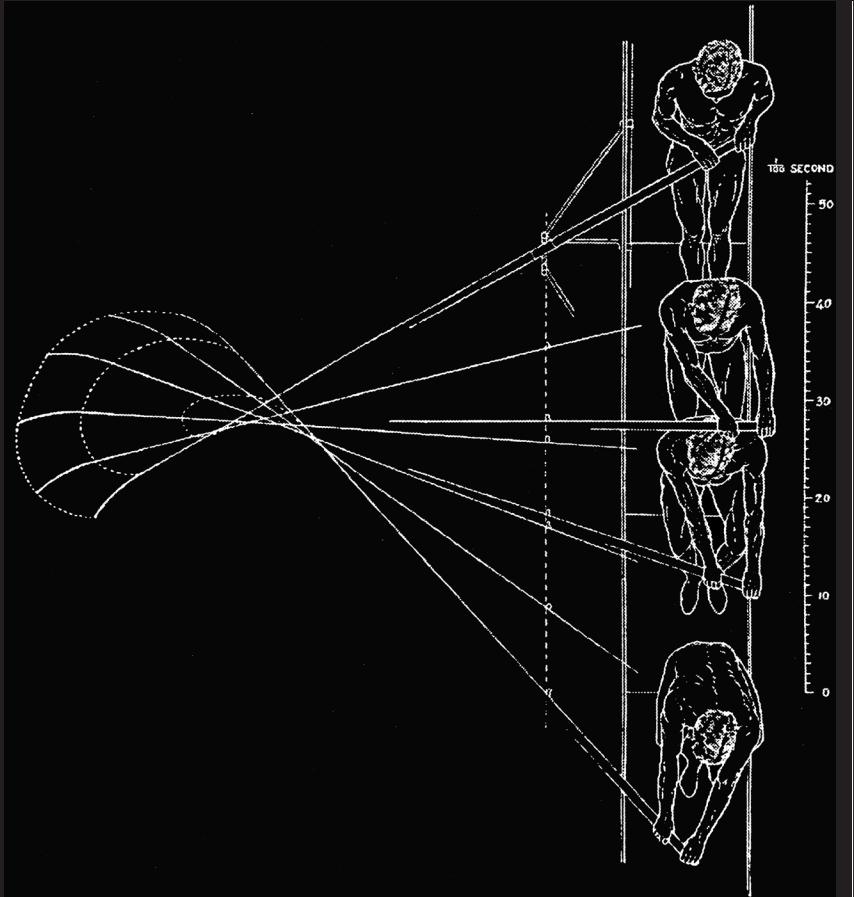
Lower level plan



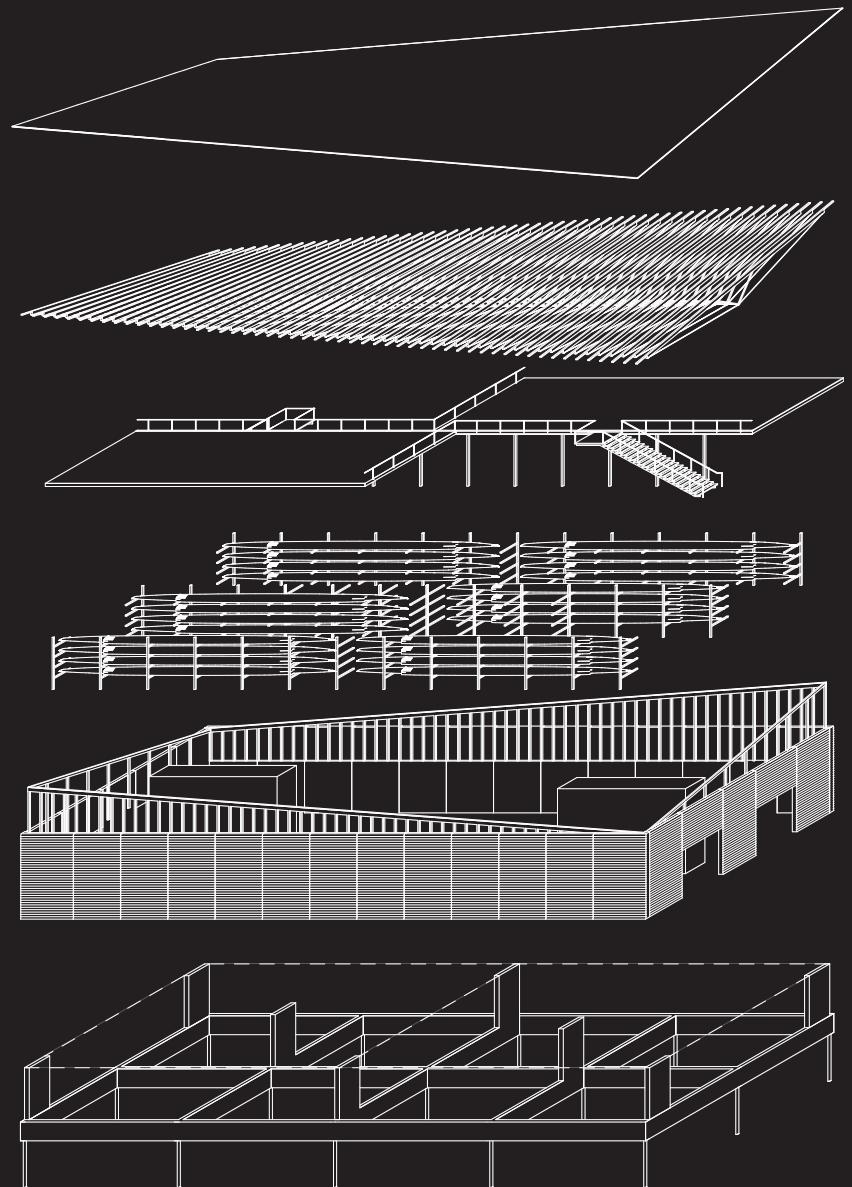
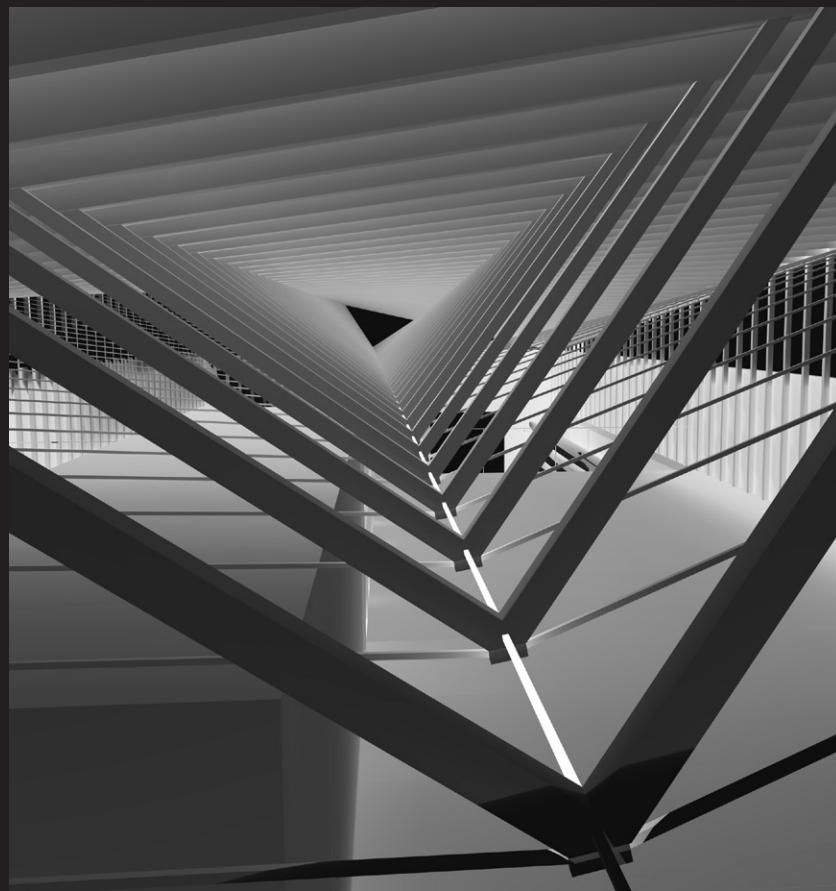
Upper level plan



I. Movement. Instead of using the frame as a boundary, the structure of the boat house uses the idea of frame as a sequence in time, a filmic episode in a continuous line of movement. The project was influenced by the photographic studies of movement by Etienne Marey and Eadward Muybridge, and sequential diagrams of rowing. (The particular observation of the oar rotating on the rigger influenced the conceptual development of the roof structure.) The sensation of movement in the building occurs through the succession of frames as well as through their unifying trajectories. While the actual shell of the building is limited in width by its trusses, it appears as if the progression of these frames could extend infinitely in length. It is as if this volume were just a segment within a much longer path. The line of movement traveled in a rowing shell is similar. The implied volume it occupies is bounded by its physical width, although its length is indeterminate and only limited by will or stamina. Both of these systems, the structural framing and the movement of the rowing shell, create anticipated trajectories of movement. These lines of movement are not intended to focus on a singular point along its path, but to create a sensation of being pulled continually along its surface to an unclear point beyond. This impulse relies on the imagined perception of the body moving continuously through space, creating a horizontal sense of vertigo.



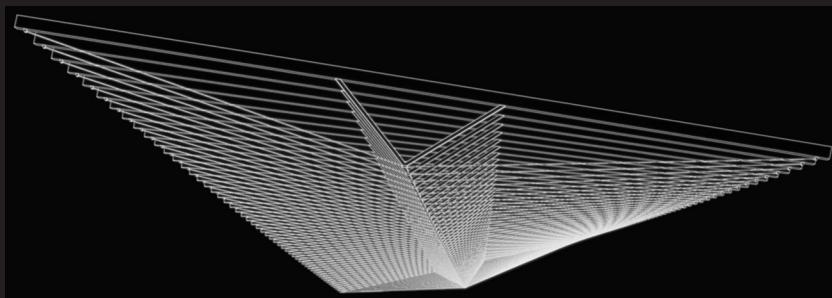
II. Vectored Form. Gilles Deleuze uses the characteristics of fabric as a model of a striated rather than smooth (continuous) space. Its construction uses two different parallel yarns for weaving, one being fixed (warp) and the other mobile (woof). Basketry uses a similar method of construction and creates a similar product. The repetitive intertwining of the “woof” with the “warp” uses lines to define a surface or a volume, the width and spacing of its striations determines the continuity of the whole.³ In both of these constructed forms, the vectored form of the components suppresses any hierarchy, merging with the surface and becoming more volumetric in character. Vectored form becomes woven surface becomes volume. This process of using a rhythmic assemblage of fixed and flexible elements to create a striated space is analogous to the act of framing as well as to the act of rowing. The truss beams of the Rowing Club structure rely on their thinness and tight spacing to similarly create the appearance of a homogeneous system. Yet, the space created is continually interrupted by the visible intervals of its elements. As they are assembled, the varying angle of the linear wood frames begin to define a continuous, though irregular, volume. After the wood framing is fixed in place, the steel tension rod and cables are attached, creating a woven surface. While defining a volume, these elements still carry the vectored form from their sources: the sawmill, the production line, and the organic linear growth of wood.



III. Volumetric. Volume in the space also emerges from the stacking effect of the series of sectional layers—the frames. This repetitive use of the frame simultaneously unifies and divides the space contained within the structure. These rhythms are similar in character to a computer animation; the number of frames in a sequence determines its smoothness and continuity. Fewer frames and greater intervals increase the sense of interruption, and shifts the focus on to each frame. By increasing the number of frames and decreasing their intervals, the frames become unified as a continuous surface. The individual frame gradually shifts from a planar surface to merge into a volumetric form as the frames increase in frequency. Still, the pattern of parts always remains a texture in the whole, despite the increasing appearance of homogeneity as the parts become infinitely small.

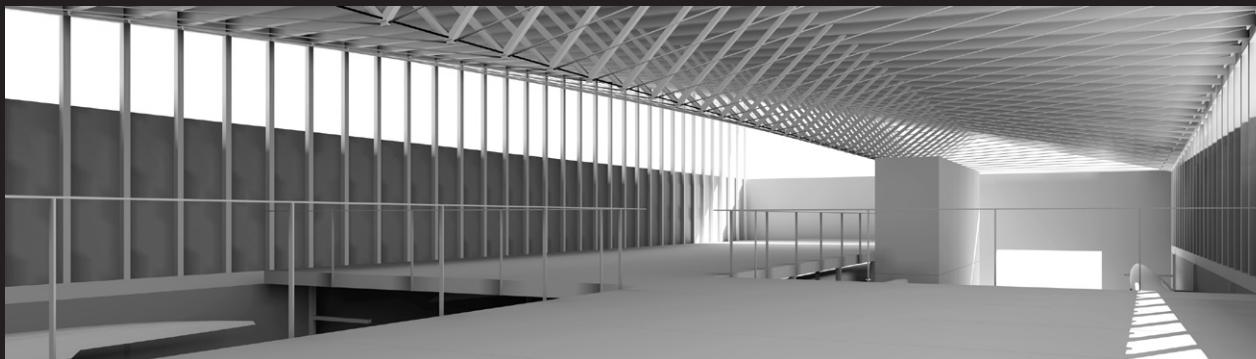
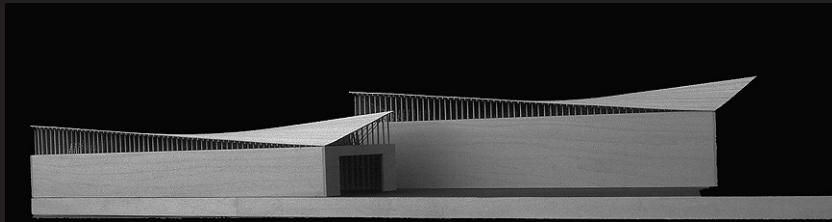


IV. Module and Measure. The example of seventeenth-century stereotomy (cutting of solids) used orthographic projection as a measuring device to cut complex mannered forms from a series of stone blocks. While the forms were generated using essential geometrical figures (lines, circles, triangles), these were suppressed when diluted by multiplication, resulting in a more continuous surface. The drawings used to measure the stone were often complex geometrical frames which defined internal sections. These two-dimensional drawings, or “traits”, were effective tools for deriving and resolving complex three-dimensional relationships.⁶ (Traits are an interesting precursor to the computer model.) While their use initially guided the excavation of the form, their use in directing the sequence of assembly and the relationship of parts has a similarity to the process of framing. The final singular form unifies modular sections of stone with remarkably thin joints to give the illusion of continuity and completeness.



The frame parallels the use of the trait in stereometry, each variation in its geometrical frame creates a more plastic overall form. Conversely, each truss in the Rowing Club is identical in form for economy, varying only in position and the resulting orientation of its vertical support. This slight irregularity in orientation becomes extreme when compounded. The module itself is not simply a frame: its linear nature comes from the linear means of production and the direction of the material growth. The nature of the wood frame is always directional, preventing the level of plasticity that is possible in stone. Thinness of the module and tightness of the spacing of the interval create a more continuous volume and a more plastic form.

V. Texture: the Continuous and the Interrupted. The form of the Rowing Club structure is simultaneously continuous space and interrupted space. The framing itself attempts to move between three-dimensional exaggeration and two-dimensional control—between volume and surface. At a close perspective, the interval between the frames or the boundary of the frame itself carries the most interest. At a distant perspective, the trajectory created by the repeated surface of the bottom cord of the truss and the homogeneous aggregate of the intervals of framing is stronger. Yet each perspective engages a space which is similarly tactile in character. The spacing, while interrupting the overall smoothness of the volume, has a homogeneity which gives it continuity. As with other material forms which are produced in a linear assembly, it appears as if this production of frames can extend infinitely. The lack of a point of convergence, a clear edge or a central axis adds to this illusion. The rhythm of the act of rowing carries a similar mechanistic quality as the repetition of framing. Rowing also relies on measure. Through physical control and timing the rower completes a complete sequence of movements in a carefully defined interval. The space of the interval is the residue of labor in its close repetition and controlled details. Yet, unlike rowing, the sequences of labor in framing leave a permanent representation in both its space and the rhythm of its elements.



Project Credits

Vincent James, Principal; Andrew Dull, Collaborator; Nathan Knutson, Bob Loken, Scott Muellner, Taavo Somer, Paul Yaggie, and Jennifer Yoos, Design Team; Jay Lane, Computer Imaging Consultant. Carrol, Franck & Assoc., structural engineer; Coen + Stumpf, landscape architect

Notes

1. James P. Sheldon and Jock Reynolds, *Motion and Document, Sequence and Time: Eadweard Muybridge and Contemporary American Photography* (Andover, Massachusetts, 1991) pp. 4–32.
2. Wilhelm Worringer, *Abstraction and Empathy* (Chicago, 1997) p. 22.
3. *Ibid.*, pp. 15, 16, 137.
4. *Ibid.*, *Abstraction and Empathy* (Chicago, 1997) p. 24.
5. Gilles Deleuze and Felix Guattari, *A Thousand Plateaus* (Minneapolis, 1992) p. 475, 476.
6. Robin Evans, *The Projective Cast* (Cambridge, 1995) p. 179–181.