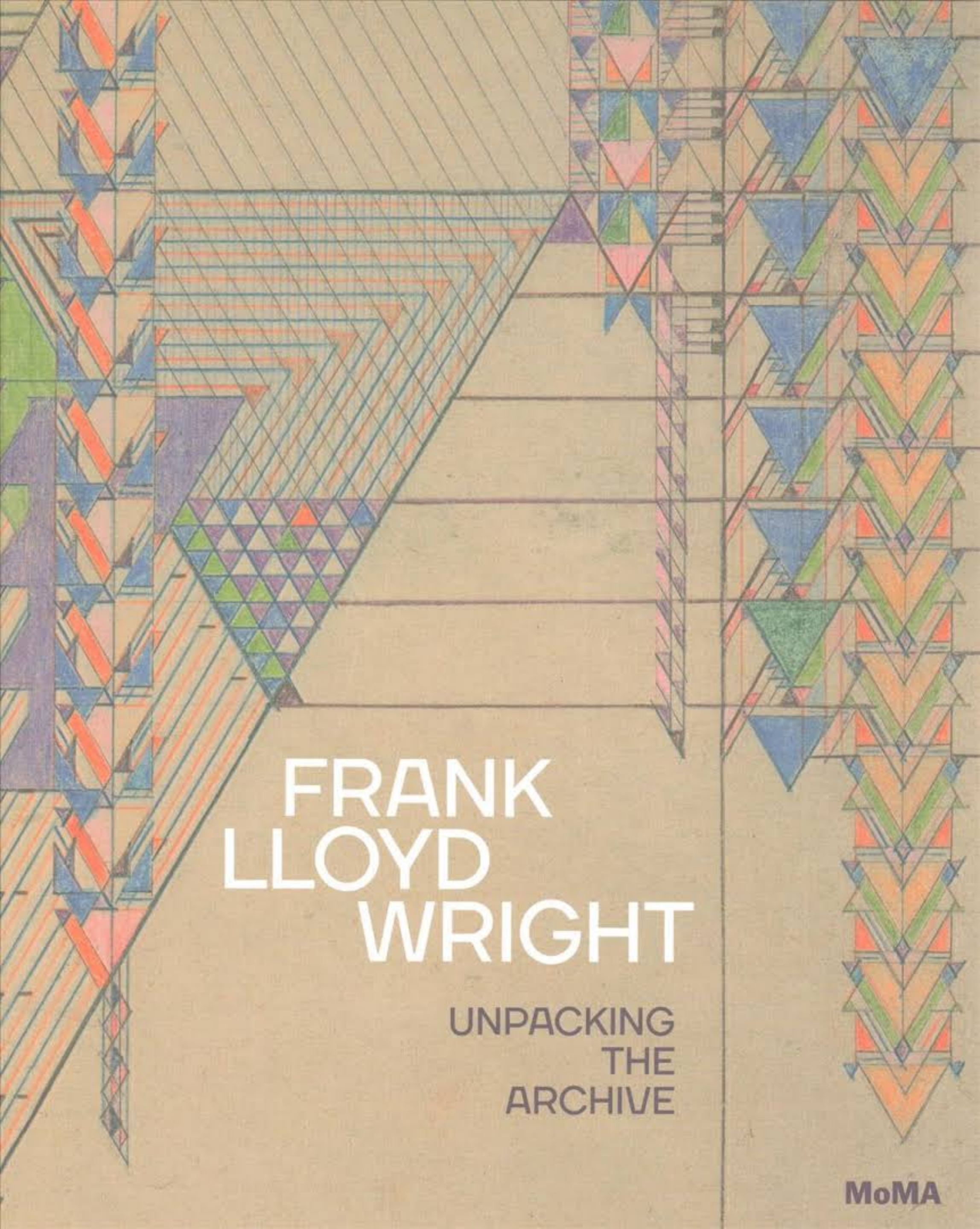
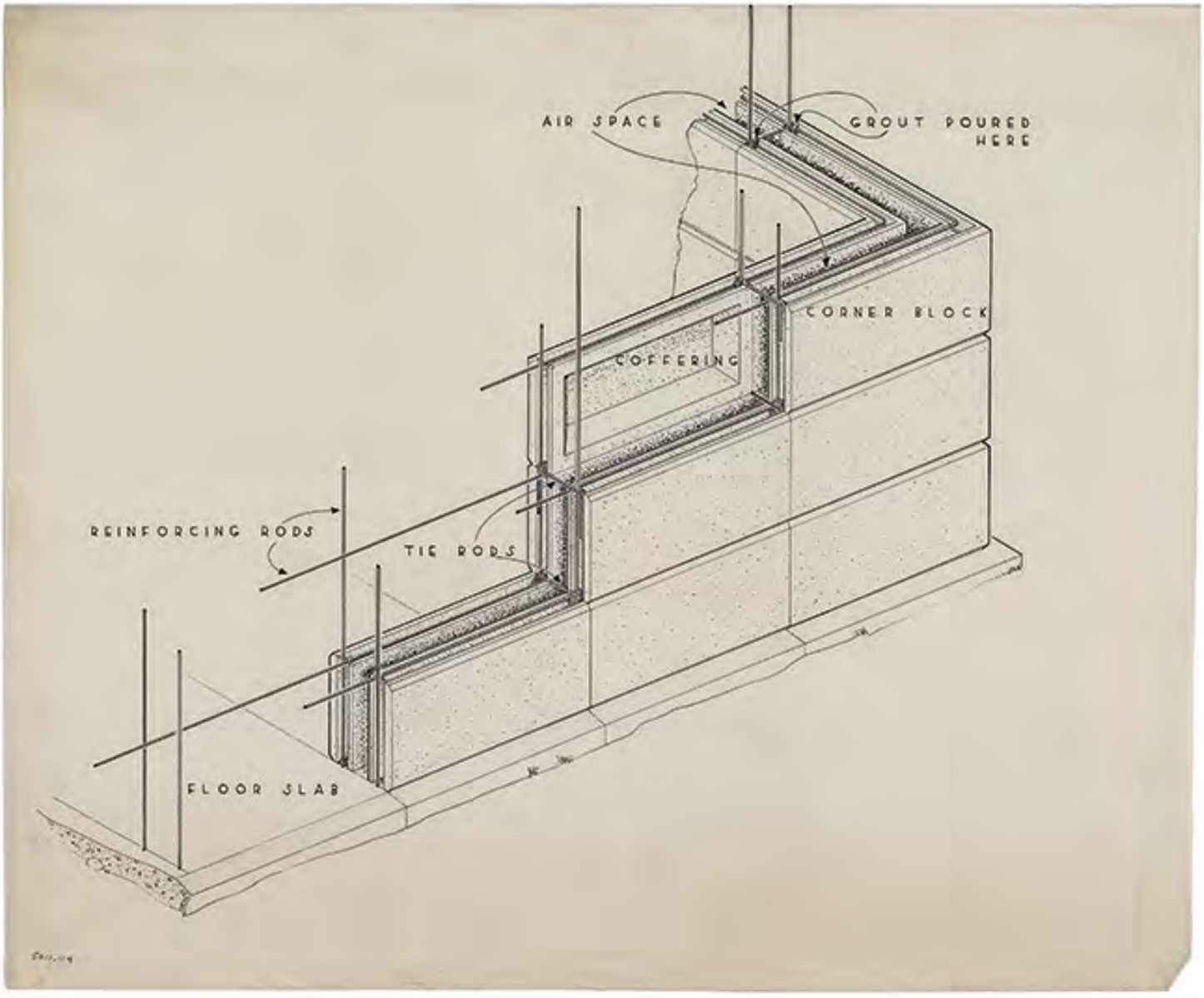


FRANK LLOYD WRIGHT

UNPACKING THE ARCHIVE

MoMA



MATTHEW SKJONSBERG

DO IT YOURSELF
USONIAN AUTOMATIC SYSTEM

Usonian Automatic system. Project, early 1950s. Axonometric diagram, 1954. Ink on tracing paper, 20 ½ x 25 in. (52.1 x 63.5 cm)

Most can raise the flowers now,
For all have got the seed.

—Alfred Tennyson, "The Flower"

With the Usonian Automatic construction system, Frank Lloyd Wright provided citizens of Usonia—Wright's preferred term for a culturally advanced North America—with the means of "doing it themselves," of building their own homes and communities. Though designing ways to provide moderate-cost housing on a large scale had preoccupied Wright for years—and resulted in his invention of numerous construction systems—the Usonian Automatic would be different: almost open source in its sensibility, it was explicitly intended to allow anyone to build their own buildings, of their own earth, on their own ground.

An axonometric drawing, first published in 1954 in *The Natural House*, demonstrates how the Usonian Automatic system worked (opposite).[1] The idea was simple: concrete blocks reinforced with steel rods running through vertical and horizontal joints, not unlike the way a textile is woven on a loom. Its open-ended nature meant that it was also scalable, capable of creating small houses, larger civic centers, as well as infrastructure, such as retaining walls, terraces, and roadways. And most importantly, Wright intended that anyone could use the system, as its basic principle—weaving—required little in the way of skilled labor, expertise, or advanced technology. Moreover, the materials were easy to obtain. Wright intended that users of his system would themselves cast the concrete blocks using soil from their own property as the aggregate. The system was entirely standardized, consisting of just twelve variants of cast-concrete blocks. An individual could use the system at a small scale or cooperate with others to build larger structures. In this way, the Usonian Automatic system approximated democratic relationships between self-reliance and community, between individual initiative and cooperative action.

What does it mean to draw a system rather than a building? A system is open-ended, capable of evolving and changing, whereas a blueprint proscribes a final product. Wright envisioned that the Usonian Automatic system would develop over time,

yielding a more democratic civic fabric—both materially and socially. He explained its political potential, describing such an approach to building as "becoming to a free society because, though standardized fully, it yet establishes the democratic ideal of variety—the sovereignty of the individual. A true architecture may evolve."[2] The Usonian Automatic system was to be nothing less than an instrument for social equity.

PRECEDENTS

Wright's first designs for moderate-cost housing appeared in the *Ladies' Home Journal* at the turn of the twentieth century, attempting to democratize access to his house designs using mail-order strategies common at the time. He subsequently experimented with factory-produced housing in his American System-Built designs of 1915–17 (see plate 2a–f). This system reduced costs by prefabricating building components in a factory, which were then constructed by licensed contractors to ensure the quality of the results. The American System-Built Houses were an early attempt by Wright to harness the efficiencies of industry and mechanization, while still producing a high-quality and beautiful product.

Wright had, at least theoretically, engaged with industry as an agent of democracy as early as 1901, when he read his seminal essay "The Art and Craft of the Machine" to an audience at Hull House, a multifaceted civic organization in Chicago. In his speech, Wright argued the machine was the "great forerunner of democracy." He cited Victor Hugo's argument in *Notre-Dame de Paris* (1831) that the printing press, by emancipating knowledge in the form of reproducible type, had superseded the symbolic and civic functions previously ascribed to architecture: the book had replaced the building. According to Wright, for architecture to remain relevant it must learn the lesson of the printing press, "the first great machine, after the great city."[3] To this end, Wright sought to instrumentalize architectural production, to use the machine as a labor-saving tool that would bring greater beauty, variety, and dignity to civilization.[4] The *Chicago Tribune* summarized Wright's argument as such: "This idea . . . says that there should be neither slave nor slave-like products. It asserts instead that machine production . . . can be and should be genuinely artistic."[5]

Wright achieved moderate success interfacing architecture and industrial production with the American System-Built Houses, and by the 1920s, while working in California, he began to experiment with another construction system that embraced a new material better suited to the desert climate of his environs: concrete. Residential construction at this time rarely used concrete—"that despised outcast of the building industry,"[6] as Wright described it—but he began to see possibilities in its malleability: "Concrete is a plastic material—susceptible to the impress of imagination. I saw a kind of weaving coming out of it. Why not weave a kind of building? . . . steel for warp and masonry units for woof in the weaving . . . I was getting interested again."[7]

The first projects built with concrete blocks were a series of houses in Los Angeles, where concrete responds better than wood to the incessant sun, and is also fireproof. First at the Millard (La Miniatura) House (1923–24) and then in subsequent designs such as the Ennis House (1924–25), Wright grappled with the tectonic challenges of concrete—namely its amorphous, plastic quality—by casting the concrete into richly patterned blocks made with earth taken from the building site.[8] This process imbued the concrete with the texture and natural color of the surrounding landscape, thus transforming the material into "a thing of beauty—textured like the trees."[9] At the Ennis House, close associates supervised the construction pro-

cess, which capitalized on the open-ended weaving process and scalability of this system—what Wright came to describe as his textile-block system (plate 7)—to build a rambling complex. The house and retaining walls are nearly indistinguishable, stitched across the hilly site and serving multiple functions, such as roadways for access and water catchment, and terraced gardens for soil conservation and to create a cooling microclimate (plate 8).

The Ennis House, as well as Wright's other concrete-block experiments in Los Angeles during the 1920s, succeeded in transforming a banal, ubiquitous material into a beautiful and scalable system of construction. However, the system had limited applicability with regard to democracy and participatory processes because it still required, at least to some degree, skilled labor. Wright acknowledged this conundrum in the context of his Usonian house projects of the 1930s, another attempt to produce moderate-cost housing that relied on prefabricated "sandwich panels" made by sheathing a core of plywood in board and batten. Sandwich panels lowered the cost of Usonian houses, but their design and construction was complex and precise, requiring apprentices to master the standard details and then travel to supervise construction. As Wright himself later wrote, "a home like this is an architect's creation. It is not a builder's nor an amateur's effort. There is considerable risk in exposing the scheme to imitation or emulation."[10]

The widespread social and economic crises of the 1930s reinvigorated Wright's ambitions for architecture to advance democracy; however, the Great Depression also forced him to reconfigure the relationship between architecture and mechanization. He successfully employed the textile-block system in the construction of the Arizona Biltmore Hotel, in Phoenix, which opened in February 1929, but his most ambitious project employing the system, the San Marcos-in-the-Desert Hotel (1928–29) in nearby Chandler, was derailed by the stock market crash that October. In 1930 Wright gave a series of lectures at Princeton University in which he expressed concern that machine power and the standardization it brings threatened to diminish rather than increase the quality of architecture and human life.[11] His trepidation about mechanization and architecture extended to housing and real estate. Wright later criticized mass housing developments—prefabricated tract housing in the suburbs and high-density, high-rise housing in cities—that were emerging to address widespread housing shortages precipitated by large numbers of veterans returning home after World War II:

Animals are penned or stabled. Humans are "housed!" . . . We Americans planted here on earth a sweeping assertion of man's spirit—the "sovereignty of the individual" . . . it is important now to take the factory to the house . . . the right of every man [is] to be true to his better self as himself, free to dream and build. . . . Recognize the machine as the appropriate magnificent tool of pre-fabrication to be used for man, not on him.[12]

Factory production, it seemed, had resulted in the very "slave-like" conditions and products that Wright had forewarned against in his 1901 speech "The Art and Craft of the Machine," leading him to explore new ways for architecture to realize the lessons of the printing press and, in so doing, advance social democracy. Since his first engagements with mass production in the early twentieth century, Wright had sought to reduce costs while maintaining the highest design standards by outsourcing complex processes to factories or to his own highly trained associates. With the Usonian Automatic system, Wright advanced an alternative to machine production that would "take the factory to the house."

USONIAN AUTOMATIC

In 1938 Wright gave a lecture to the Federal Architects' Association in Washington, D.C., where he boldly claimed, "I don't build a house without predicting the end of the present social order."[13] In just over a decade, Wright invented a new construction system that did not rely on machines or trained craftsmen but instead was simplified, open-ended, and accessible to non-experts: self-build. In 1949 Wright reinvented his textile-block system as the Usonian Automatic, streamlining the system until it consisted of just twelve standard block shapes, from which a wide variety of structures at different scales could be constructed (plate 9a–d). Wright explained that "automatic" meant that now homeowners could build these houses themselves. And they did—at least to some extent.

Some homeowners, such as Elizabeth and William Tracy, of Seattle (1955), and Bette and Theodore Pappas, of St. Louis (1955), cast their own blocks and effectively built their own houses. Beverly and Gerald Tonkens, of Cincinnati (1954), engaged Wright's grandson and Taliesin apprentice Eric Lloyd Wright to supervise the construction of their house by a local contractor—still allowing the family and the children to participate, if less strenuously. In each case the houses were built using the twelve standard blocks—including those for walls, roof, and fascia, and the particularly beautiful perforated corner blocks with glass inserts (fig. 1 and plates 10, 11).

The Usonian Automatics harnessed the spirit of the machine, rather than factory modes of production. As a system, it was capable of endless reproduction and accessible to anyone, even if it was perhaps too complex to be considered truly do-it-yourself. This approach had material as well as political advantage over Wright's earlier wood-based construction systems because concrete blocks were scalable as well as relatively sustainable, an important consideration as Wright became worried that "Usonian forests" were being endangered by overuse. "Wood," he acknowledged, "grows more precious as our country grows older."[14] Moreover, the tectonic properties of wood relative to concrete limited the variety and sizes of buildings that could be constructed of it. If, as Wright believed, individual houses were the building blocks of cities, and thus of political and social realities, concrete offered the ability to build at the scale of a community.

Indeed, through all the building materials he worked with, Wright sought a system that would bridge house and community. In the last of his published Princeton lectures, titled "The City," he illustrated the text with an image captioned "Small Town Hall, plastered frame, 1912–1913."[15] The project is, in fact, one of the American System-Built Houses of 1915–17, and not a town hall at all (plate 12).[16] Nevertheless, it is notable that Wright illustrates "The City" with an individual house, and that this house is given a civic function. The date given the project has another interesting civic association, as 1912–13 were

Fig. 1. Tonkens House, Cincinnati. 1954. Wall construction using Usonian Automatic system

the years the City Club of Chicago held an international competition for a neighborhood design, to which Wright submitted a remarkable entry (see p. 179, fig. 4)—an early prototype for Broadacre City (1929–35). The proposal was a square field edged with a linear transit spine, commerce bordering its main roads, a latticework interpenetrated by housing, and its civic functions clustered within a linear park system. The city, woven through the existing urban grid as an armature, is revealed as aggregation and composition, nature and culture, bottom up and top down. Wright's nuanced design attributed a civic dimension to housing, balancing individual and communal spheres.

Lecturing on Broadacre City years later, Wright advocated for the construction of such small town halls, calling them "little forums" and praising their ability to gather diverse peoples and viewpoints together in one space:

Why don't you build such little forums? Build one . . . down there in the labor section where the labor fellows could get up and sass away at each other and their bosses sass back as you know they are doing right now in the papers. They could do it better down there in the Forum. . . . We need to educate and stimulate our people to take a big hand in this thing we call Democracy. We must talk it out. *To do it ourselves we must get together to express our own ideas. Isn't that in the very spirit of democracy?*[17]

Little forums created opportunities to practice democracy by providing a physical and social space for communities to reconcile their differences. In 1941 Wright would take this idea a step further by founding *Taliesin Square Paper: A Nonpolitical Voice from Our Democratic Minority*, a series of self-printed pamphlets published by the Taliesin Fellowship that were vehicles for Wright to express and circulate his political views. Wright clearly understood, in ways that seem especially prescient in today's political climate, the complex relationships between physical and social communities and between the media and democracy. He advised the same audience he lectured to about "little forums" also to create "little papers":

Let them "cut loose." Only make sure that they are of A1 liberal democratic quality; that they are really grass roots stuff or better. . . . God knows we are so very tired of being spoon-fed by this great newspaper corporation now so compactly organized for profit that it will never let anything get through that is inimical to its own interests or that has any reflection to cast upon "vested" interests in general. Let's once again hear from the American people![18]

Little papers, of course, had the ability to circulate ideas more broadly than buildings, recalling Hugo's poetic description of the emancipated pages of the printing press blowing in the wind like the birds leaving the cathedral at dawn. Just as the printing press democratized access to knowledge, Wright's self-build system aimed to democratize access to architecture.

Wright's most successful merger of do-it-yourself construction systems and democratic ambitions was arguably in the "little forums" of Taliesin and Taliesin West. Wright envisioned Taliesin as a model democratic community—an enactment of the democratic potential, both social and architectural, a corollary to that which was latent in the Usonian Automatic system. He had earlier tested the limits of self-build concrete blocks at the scale of a small community when he was commissioned to design the campus of Florida Southern College in 1938 (plate 13). There Wright had deployed the textile-block system of the 1920s, sending Taliesin apprentices to instruct the Florida students in building with the system, and in a democratic synthesis of education and participatory labor—at a civic scale—the

Fig. 2. Florida Southern College, Lakeland. Begun 1938. Wall construction

Fig. 3. Taliesin West, Scottsdale, Arizona. Begun 1938. Desert shelter using concrete blocks, 1954. Photograph by Robert Beharka. Collection Jeanine Ferris Beharka

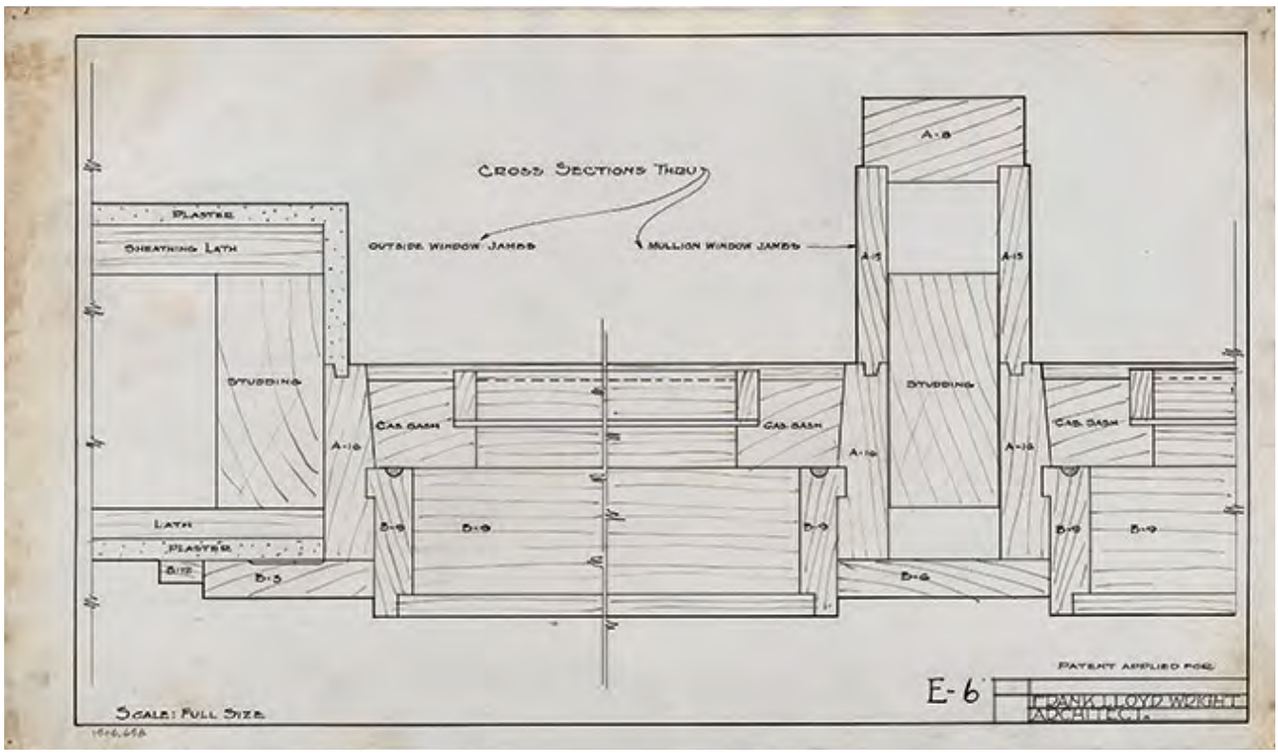
students helped to build their own campus (fig. 2). However participatory the construction process of Florida Southern College, the students still benefited from the considerable oversight and guidance of skilled apprentices and Wright himself. At Taliesin West, Wright was able to further realize his ambitions for do-it-yourself construction to advance democratic social relations.

In 1954—notably the same year that the Usonian Automatic axonometric drawing was published in *The Natural House*—Wright suggested that all the Taliesin apprentices should create designs using the system. These design assignments were submitted collectively in December of that year and can still be found in the Frank Lloyd Wright Foundation Archives. One of the apprentices built a variation of the Usonian Automatic on one of the existing tent sites at the desert campus (fig. 3). In 1955 apprentice David Dodge conducted a survey of all the tent sites, delineating in precise detail the combination of ecological and architectural factors that informed these micro-communities. It is perhaps notable that Dodge drew both the published axonometric drawing and the little-known plan of Fellowship tents, suggesting something of the cumulative, varied, and nonlinear character of the relationships between assertions of individual sovereignty and aspirations for civic design.

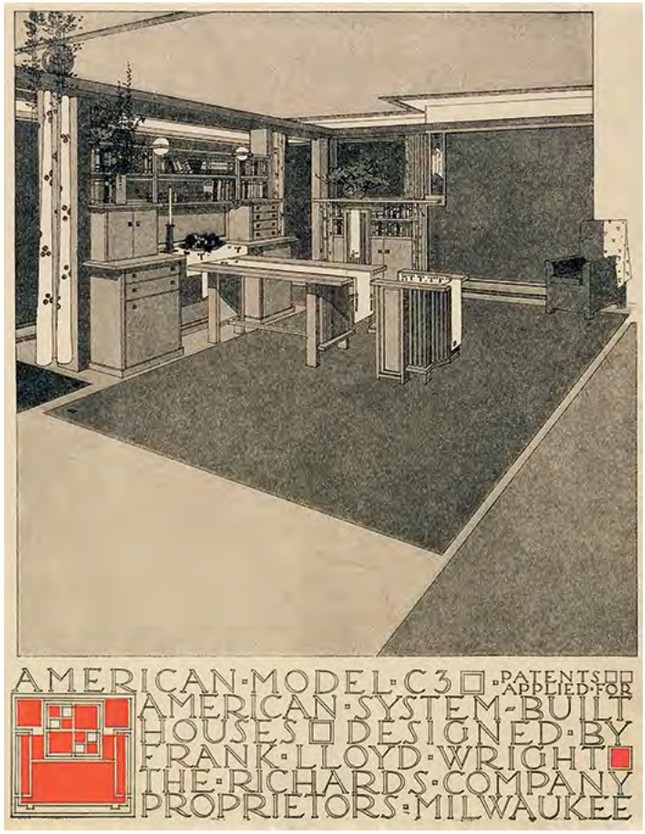
Invoking the forest as a metaphor for living communities that balanced the individual with the social whole, Wright described the textile-block house as a "tree itself standing there at home among the other trees."[19] Current research in forest ecology shows that diverse species of trees not only exchange information through their roots, assisted by mycorrhizal networks in the soil, but materials as well—indicating that about half of the carbon in these trees was supplied by other trees in their community.[20] Beyond mere analogy, the emerging discipline of sociobiology suggests that what is true for plant communities is also true for humans—it is by the delicate weaving of roots that resilient communities are established. The Usonian Automatic is thus a call to both individual initiative and to cooperative action, acknowledging that from the tapestry of our lives a civic fabric is also woven—between private and public, garden and park, small scale and large.

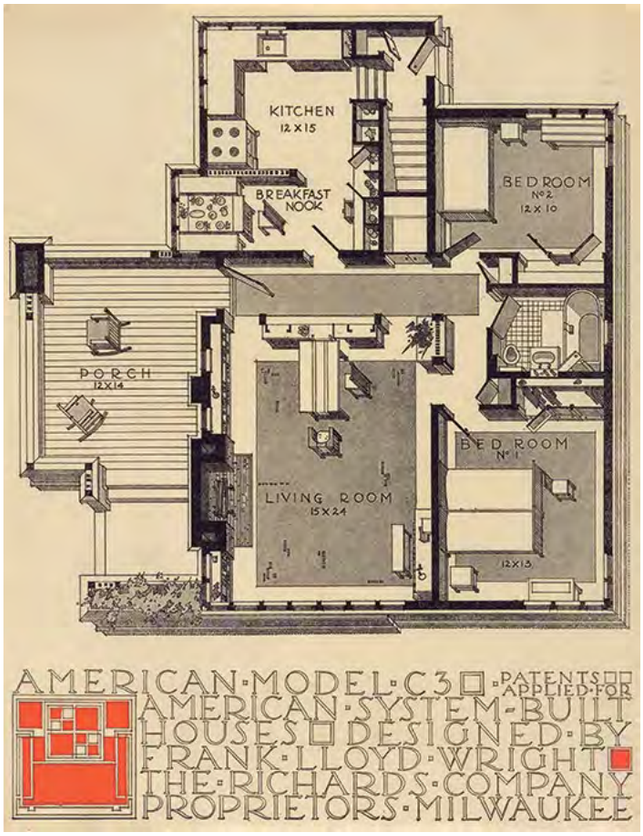
Notes

1. Frank Lloyd Wright, *The Natural House* (New York: Horizon Press, 1954).
2. Ibid., p. 205.
3. Frank Lloyd Wright, "The Art and Craft of the Machine" (1901), reprinted in *The Essential Frank Lloyd Wright: Critical Writings on Architecture*, ed. Bruce Brooks Pfeiffer (Princeton, N.J.: Princeton University Press, 2008), p. 24.
4. Ibid., pp. 28–29.
5. "Art and the Machine (March 4, 1901)," accessed January 26, 2016, http://archives.chicagotribune.com/1901/03/04/page/6/article/among-the-new-books.
6. Frank Lloyd Wright, *An Autobiography*, 3rd ed. (New York: Duell, Sloan and Pearce, 1943), p. 241.
7. Ibid., p. 235.
8. Kenneth Frampton, "The Text-Tile Tectonic: The Origin and Evolution of Wright's Woven Architecture," in *On and By Frank Lloyd Wright: A Primer of Architectural Principles*, ed. Robert McCarter (New York: Phaidon 2011), pp. 181–83. Robert Sweeney has argued that Wright's experiments in concrete block construction followed the Bollman House, designed by his son Lloyd Wright in 1922, and that Wright's first concrete-block house, the Millard House, was not, by definition, a textile-block house. See Robert L. Sweeney and David G. DeLong, *Wright in Hollywood: Visions of a New Architecture*, annotated edition (Cambridge, Mass.: MIT Press, 1994), pp. 20, 204–05.
9. Wright, *An Autobiography*, p. 242.
10. Wright, *The Natural House*, p. 89.
11. Frank Lloyd Wright, *Modern Architecture, Being the Kahn Lectures for 1930* (Princeton, N.J.: Princeton University Press, 1931). Reprinted in Pfeiffer, ed., *The Essential Frank Lloyd Wright*, pp. 159–216.
12. Frank Lloyd Wright, "Away with the Realtor," *Esquire*, October 1958.
13. Frank Lloyd Wright, *Washington Post*, sec. 2, October 26, 1938. Quoted in Robert Twombly, *Frank Lloyd Wright: His Life and His Architecture* (New York: John Wiley & Sons, 1979), p. 261.
14. Frank Lloyd Wright, "In the Cause of Architecture: Wood" (1928), in *Frank Lloyd Wright on Architecture: Selected Writings (1894–1940)*, ed. Frederick Gutheim (New York: Grosset & Dunlap, 1941), p. 113.
15. Wright, *Modern Architecture, Being the Kahn Lectures*, pp. 99–100.
16. Neil Levine, *The Urbanism of Frank Lloyd Wright* (Princeton, N.J.: Princeton University Press, 2015), p. 406n51.
17. Frank Lloyd Wright, [Address at Milwaukee Art Institute] Talk No. III (December 5, 1945), manuscript no. 2401.277, p. 15.
18. Ibid., pp. 15–16.
19. Wright, *An Autobiography*, p. 242.
20. Tamir Klein, Rolf Siegwolf, and Christian Körner, "Belowground Carbon Trade among Tall Trees in a Temperate Forest," *Science* 352, no. 6283 (April 15, 2016): 342–44.

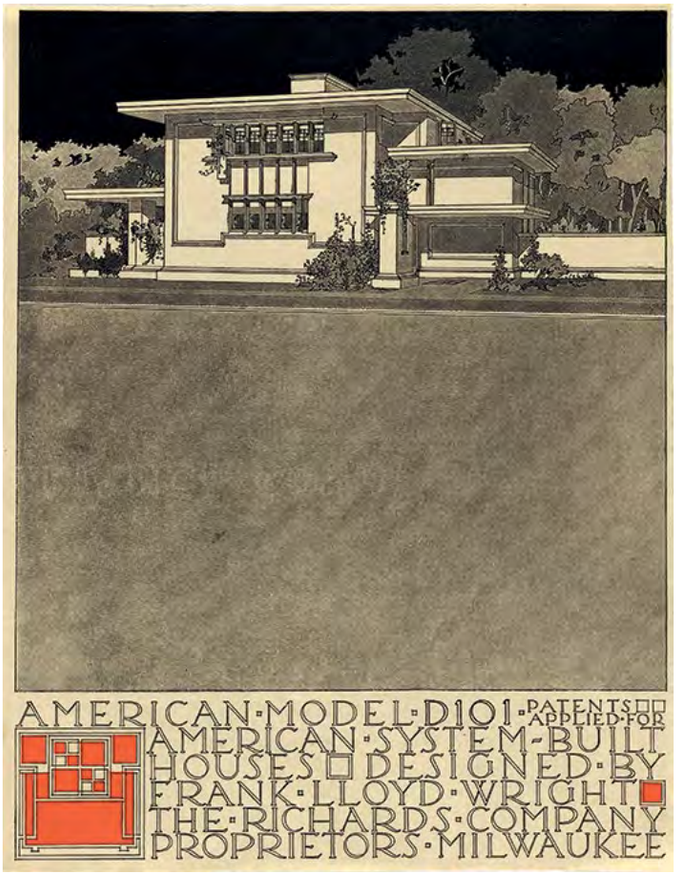


1. American System-Built Houses. Project, 1915–17. Window detail.
Ink on drafting cloth, 12 x 20 ¼ in. (30.5 x 51.4 cm)





2a–f. American System-Built Houses. Project, 1915–17. Models C3, D101, D1, A101.
Lithographs, each: 11 x 8 ½ in. (27.9 x 21.6 cm).
The Museum of Modern Art, New York. Gifts of David Rockefeller, Jr. Fund, Ira Howard Levy Fund, and Jeffrey P. Klein Purchase Fund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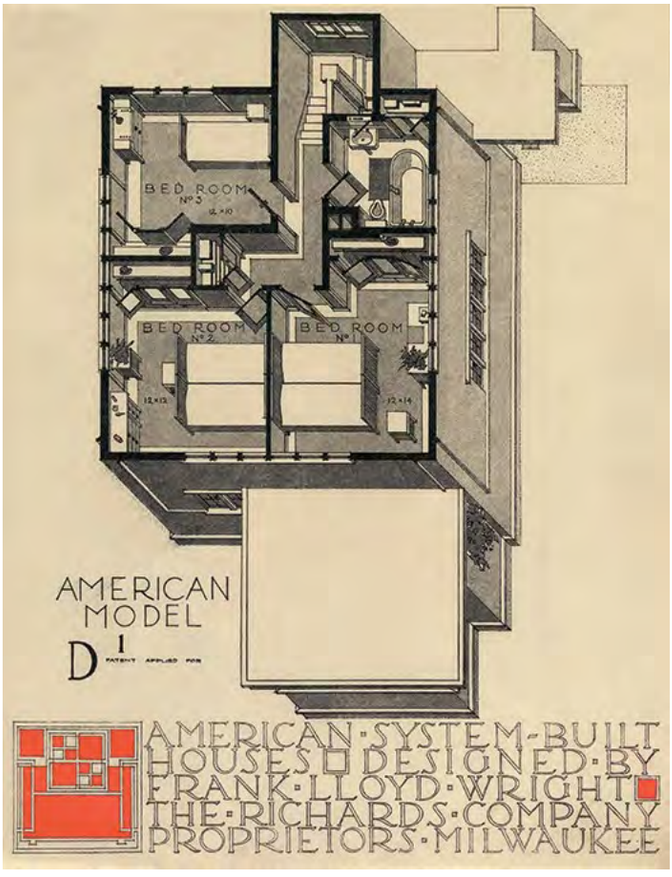
HOUSES DESIGNED·BY
FRANK·LLOYD·WRIGHT
THE·RICHARDS·COMPANY
PROPRIETORS·MILWAUKEE


BED ROOM
Nº 3
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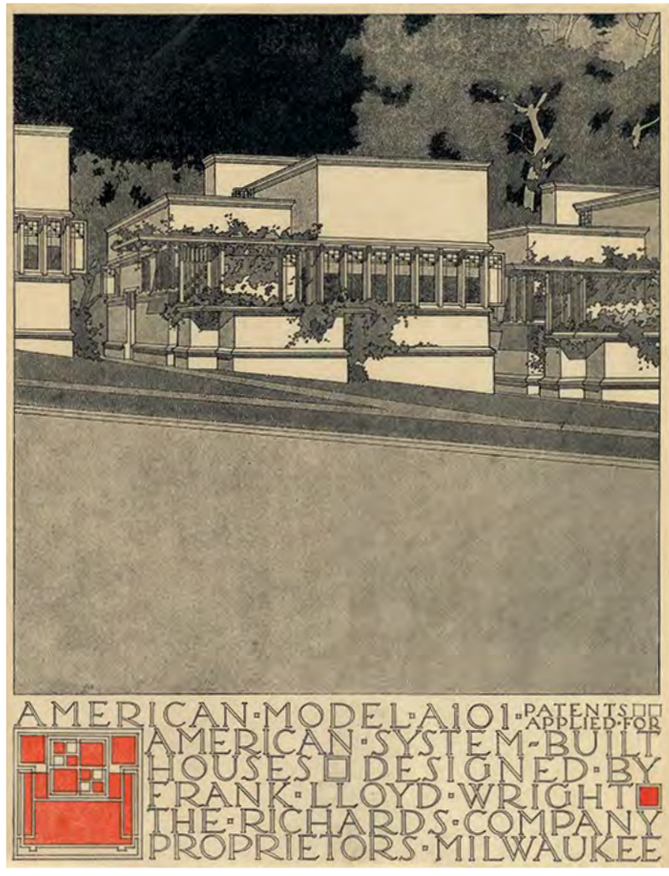
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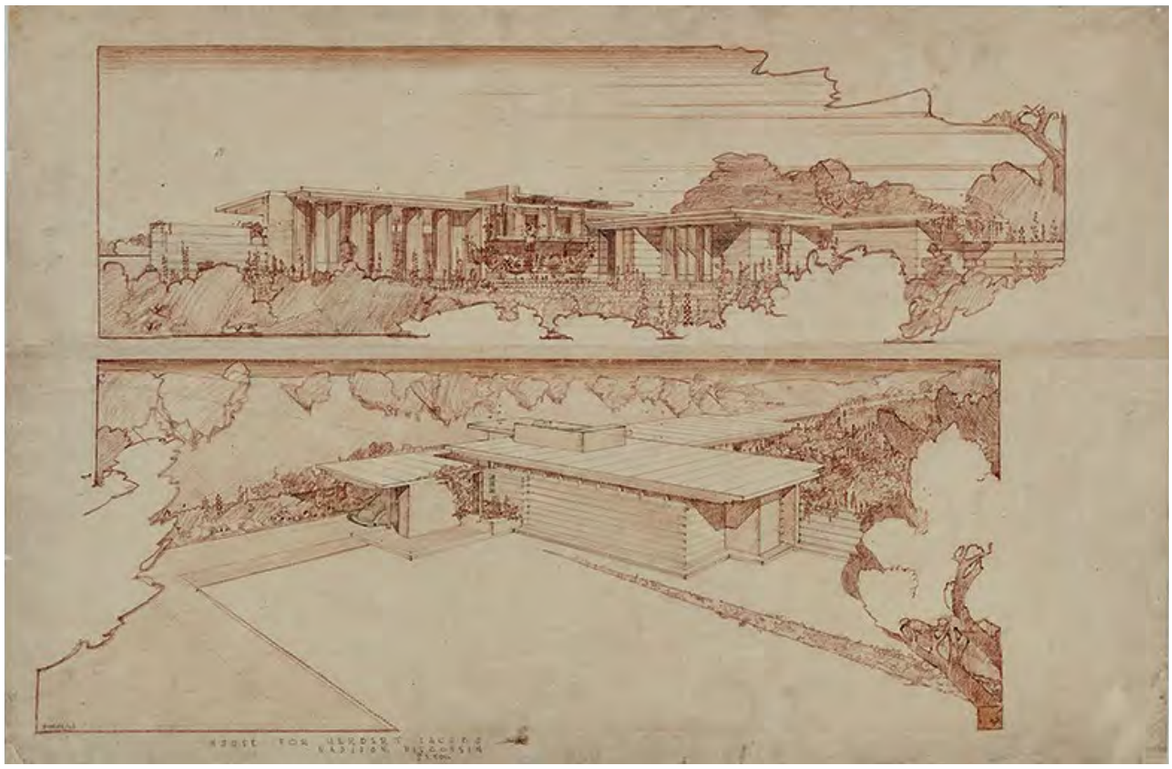
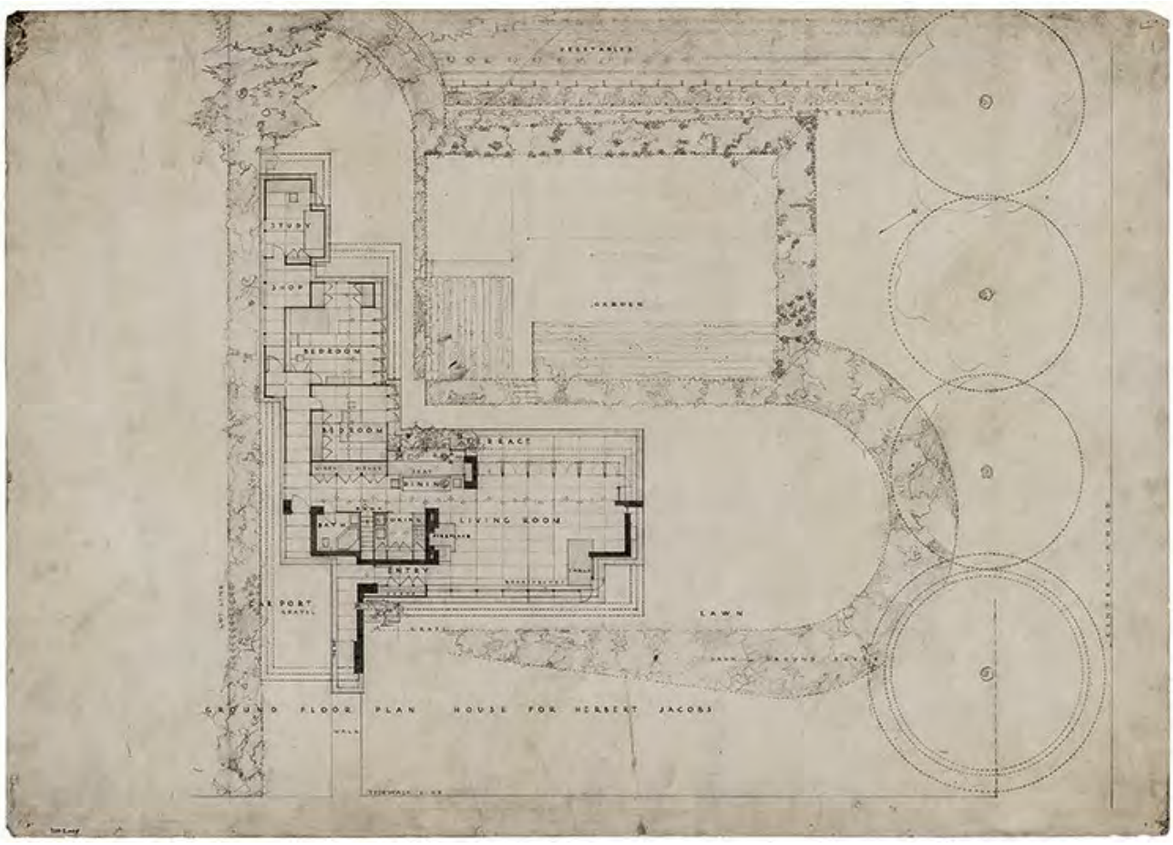
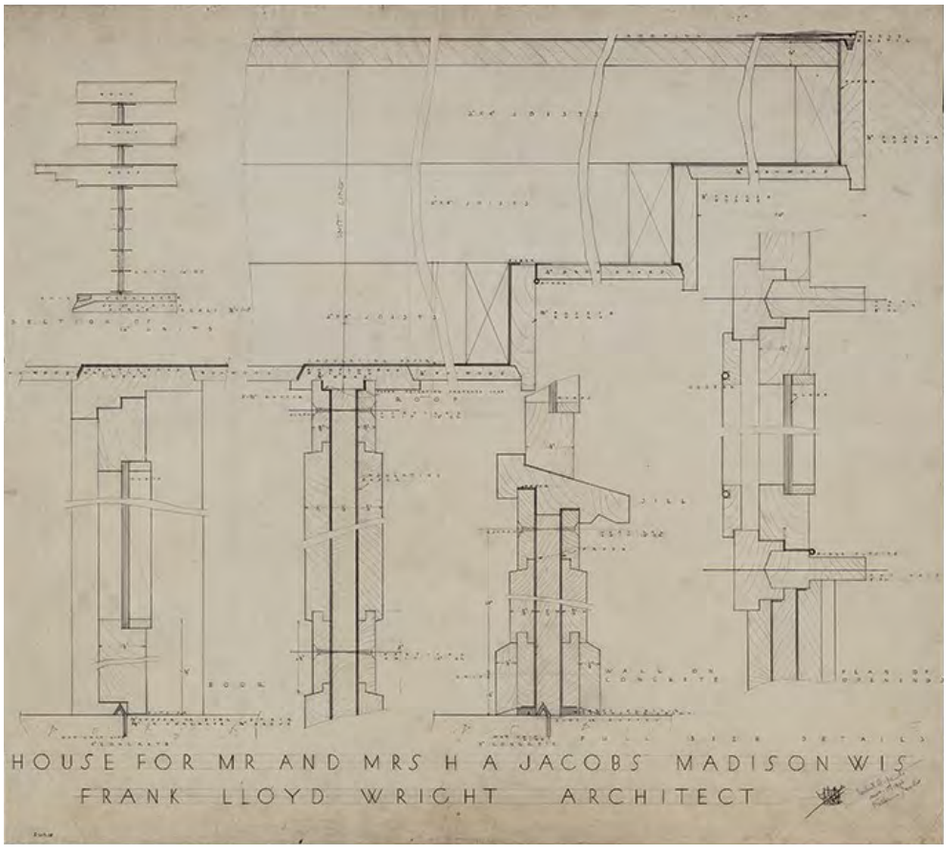
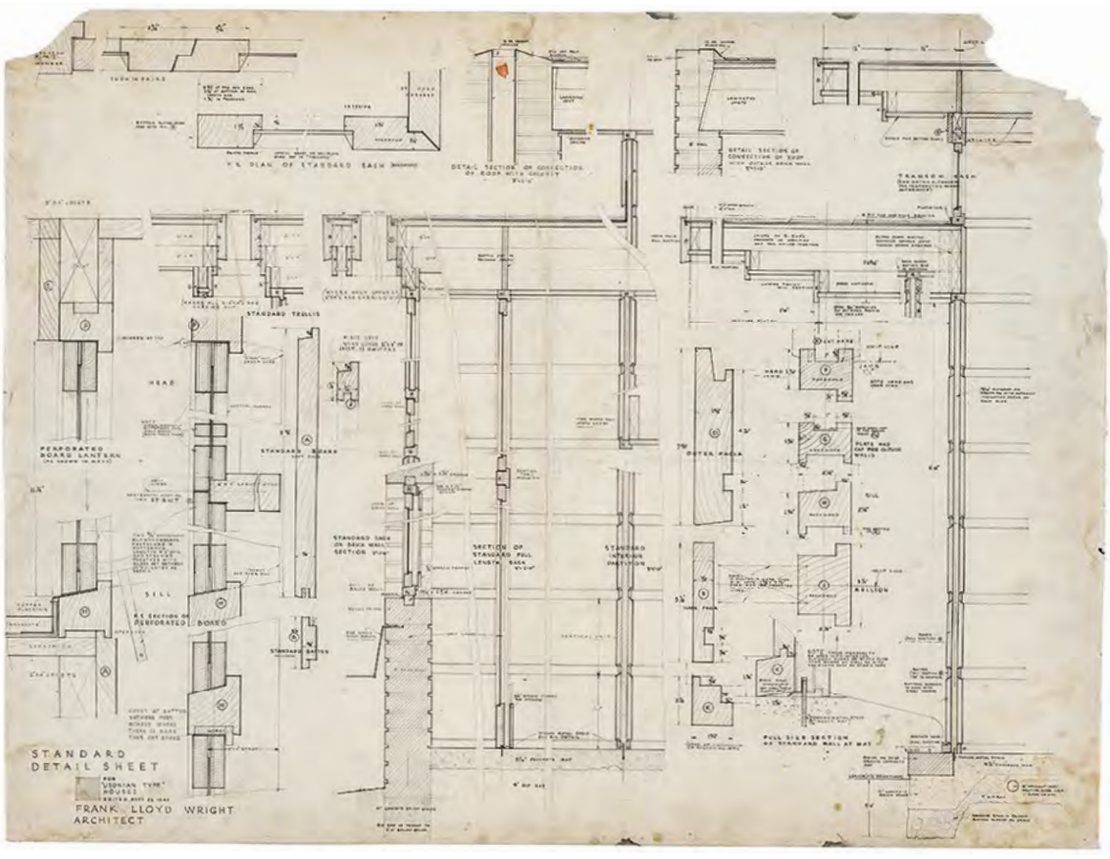




3. Jacobs House, Madison, Wisconsin. 1936–37. Exterior perspectives.
Pencil and colored pencil on paper, 21 ¾ x 32 in. (55.2 x 81.3 cm)

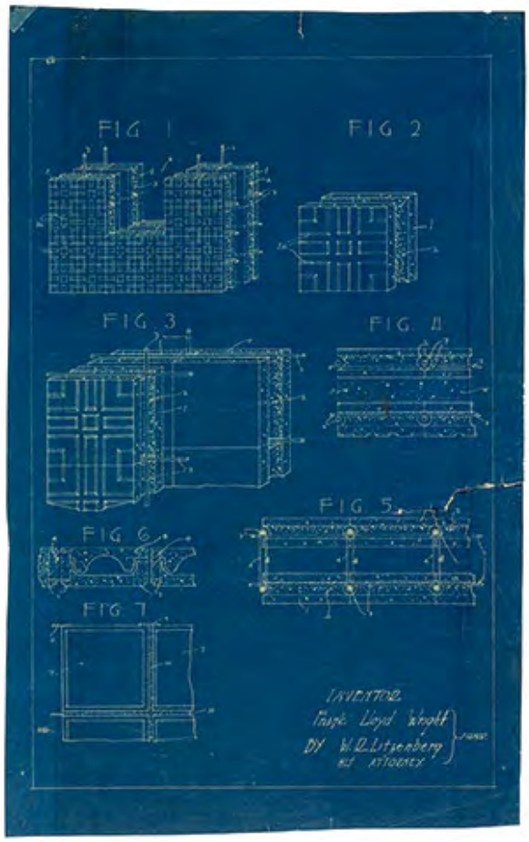
4. Jacobs House, Madison, Wisconsin. 1936–37. Ground-floor plan.
Pencil and ink on tracing paper, 24 ⅛ x 34 in. (61.3 x 86.4 cm)

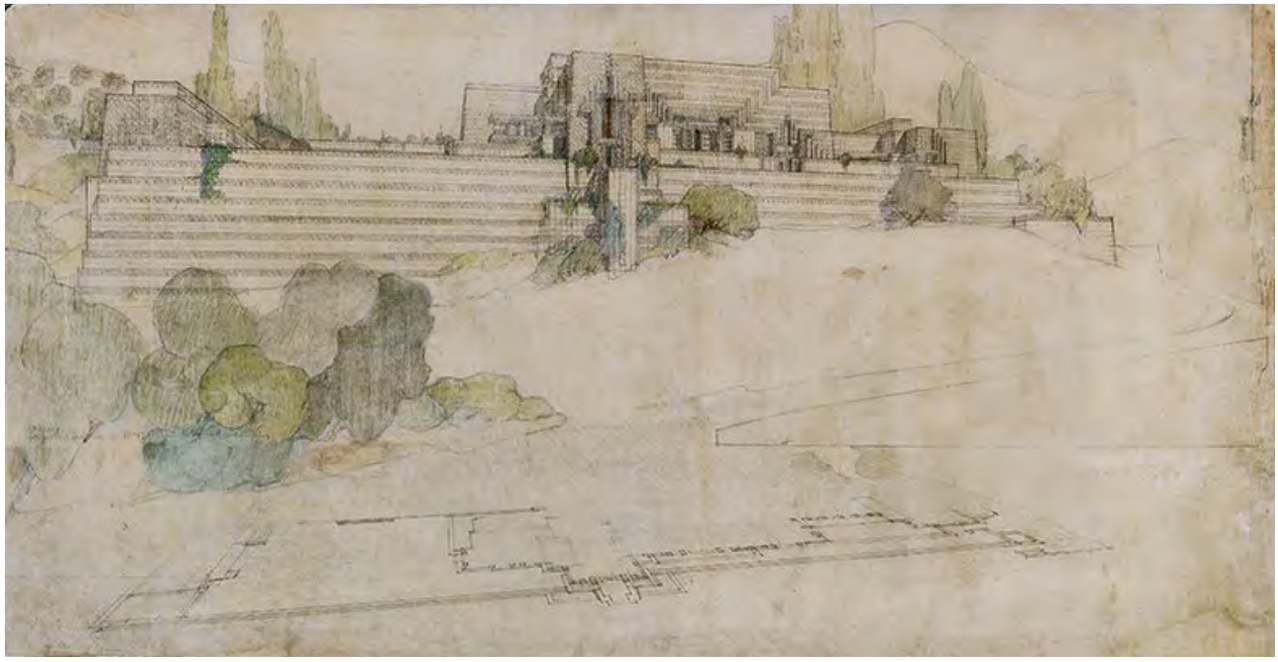




5. Jacobs House, Madison, Wisconsin. 1936–37. Construction details.
Pencil on tracing paper, 30 ¾ x 34 in. (78.1 x 86.4 cm)

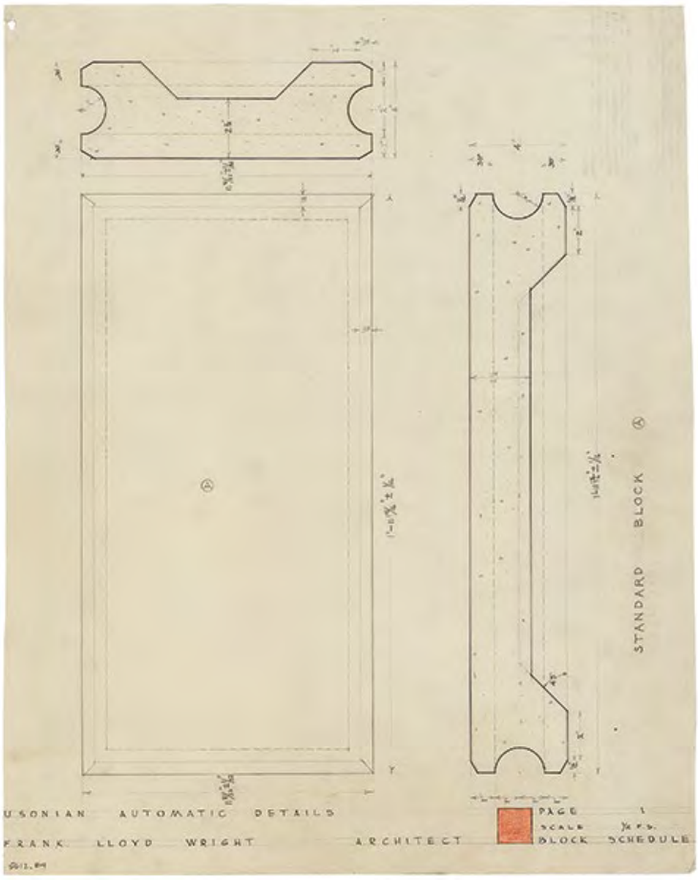
6. "Usonian Type Houses." Project, 1940. Standard detail sheet.
Pencil and ink on tracing paper, 36 x 47 in. (91.4 x 119.4 cm)

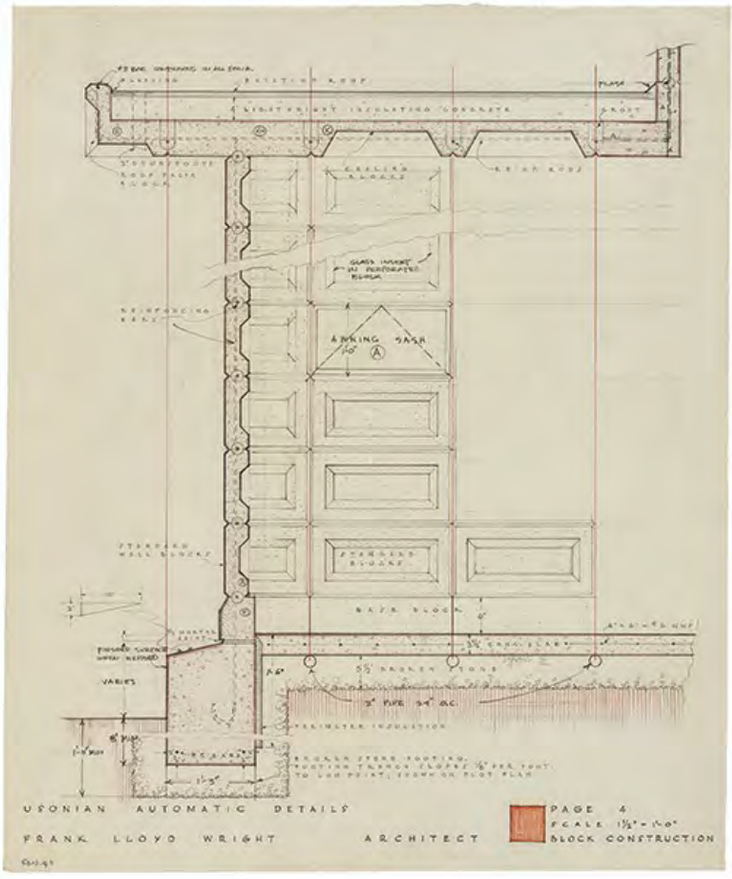


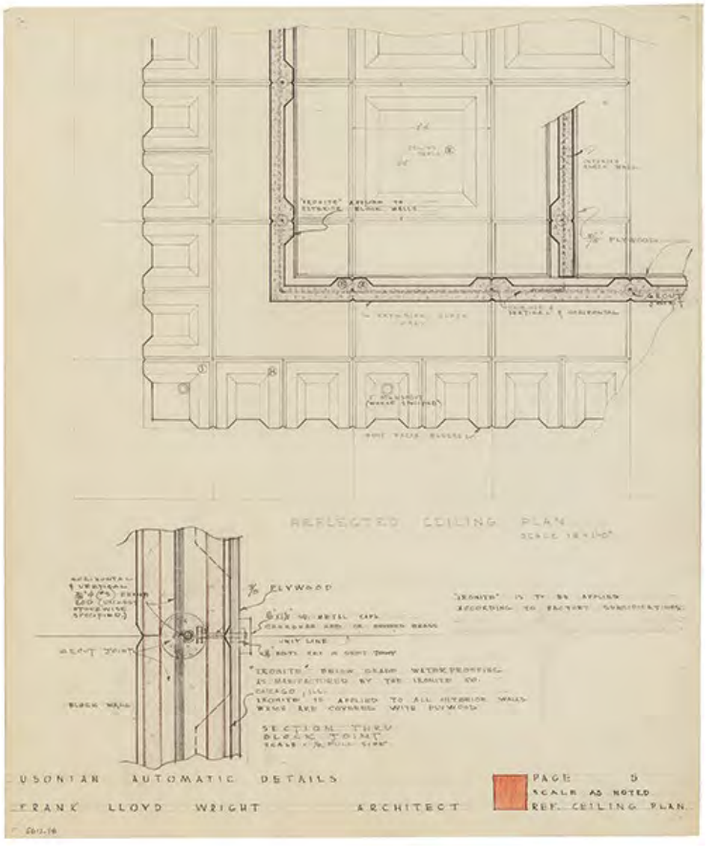


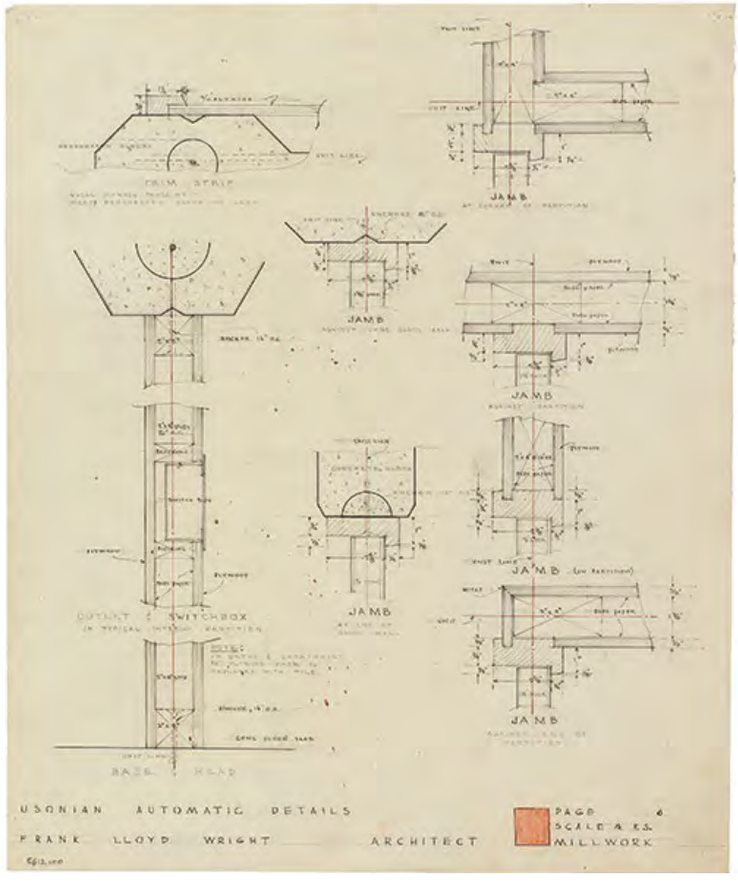
7. Textile-block system. Begun 1923. Details.
Ink on blueprint, 14 1/4 x 8 7/8 in. (36.2 x 22.5 cm)

8. Ennis House, Los Angeles. 1924–25. Plan and perspective from the southwest.
Pencil, colored pencil, and ink on tracing paper, 20 1/8 x 39 1/8 in. (51.1 x 99.4 cm)

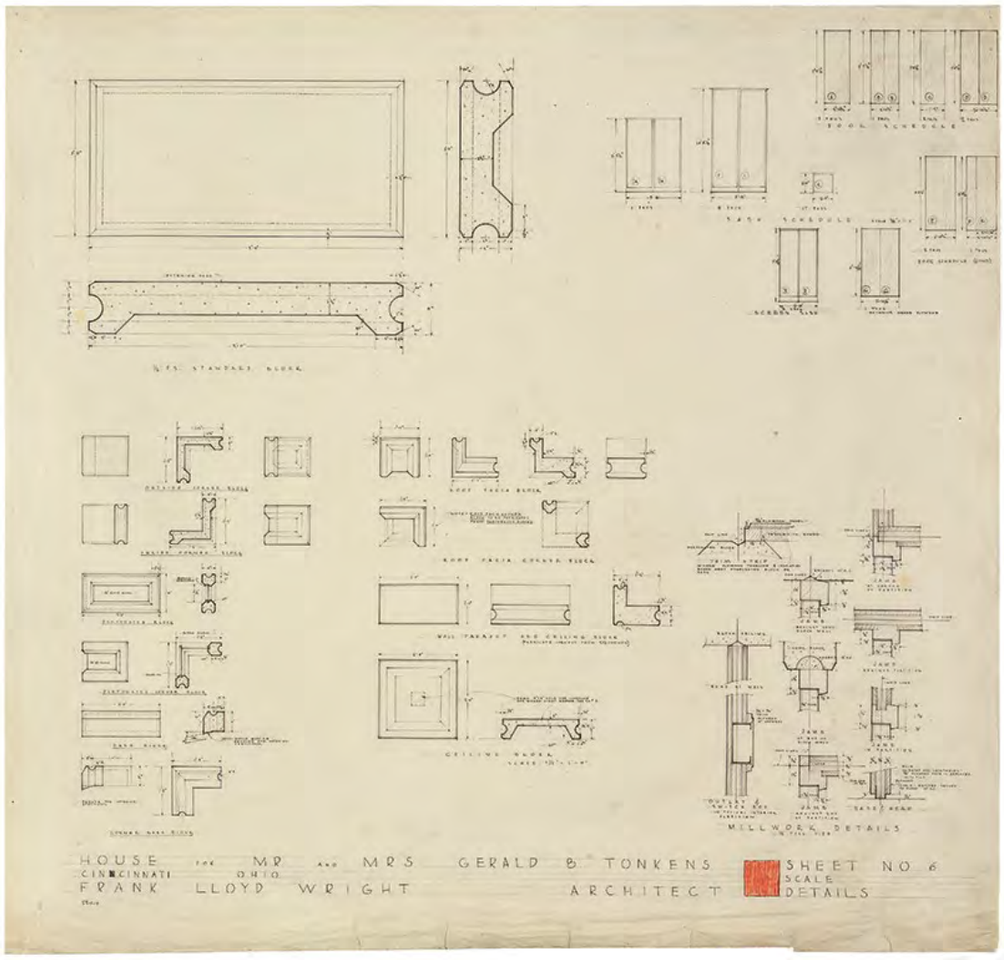


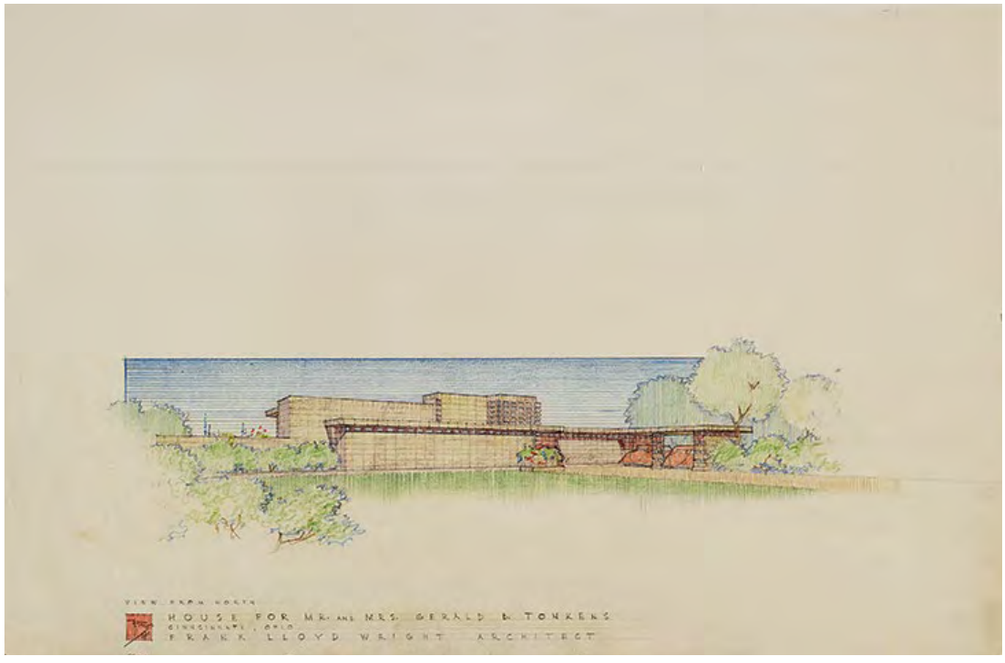






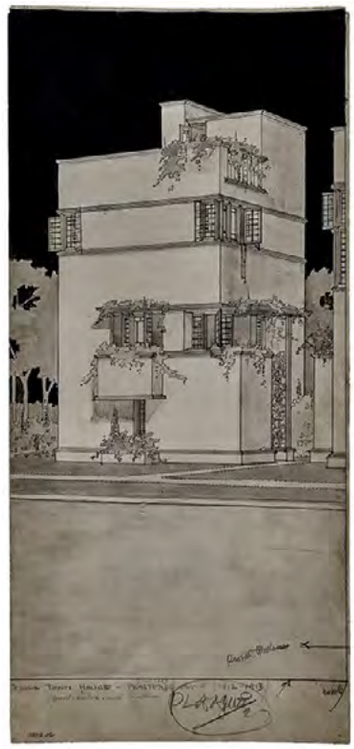
9a–d. Usonian Automatic system. Project, early 1950s. Construction details. Pencil, colored pencil, and ink on tracing paper, each approx. 18 x 15 in. (45.7 x 38.1 cm)

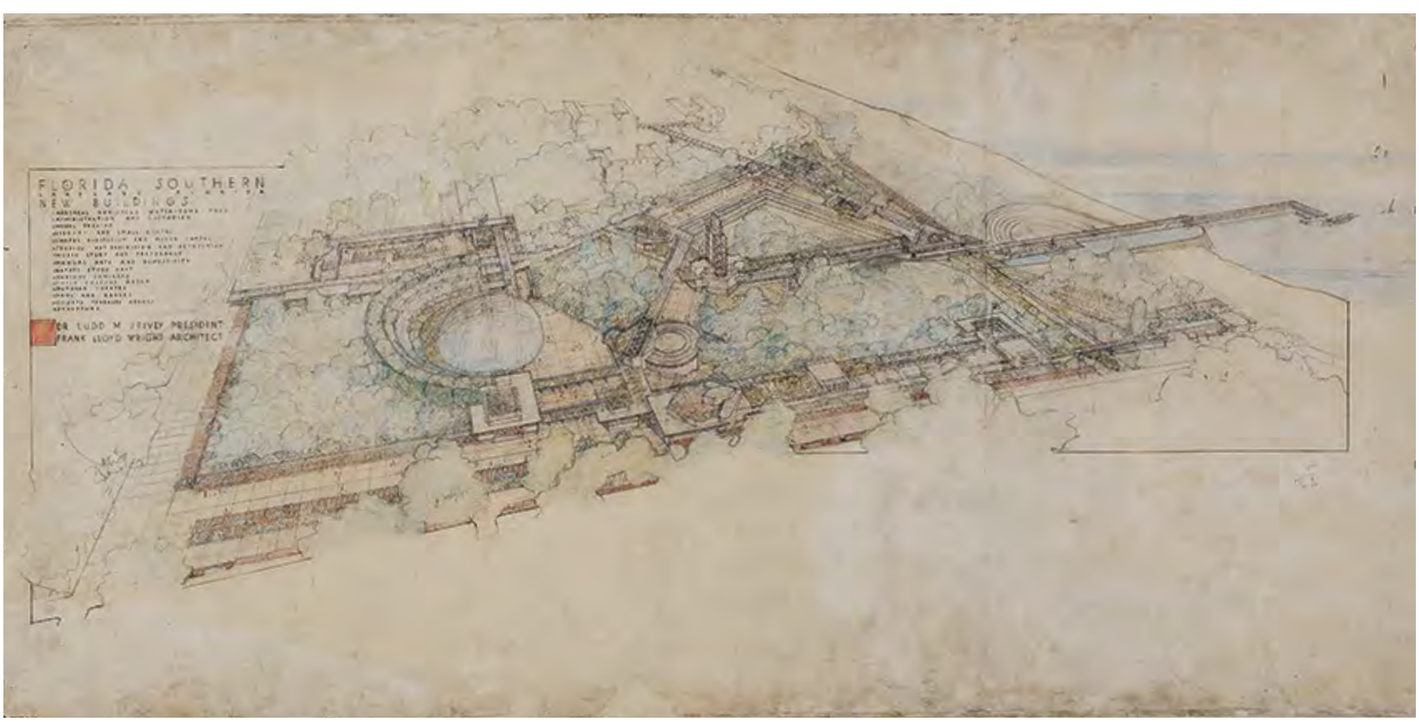




10. Tonkens House, Cincinnati. 1954. Millwork and block details.
Pencil and colored pencil on tracing paper, 36 1/4 x 37 3/4 in. (92.1 x 95.9 cm)

11. Tonkens House, Cincinnati. 1954. Perspective from the north.
Pencil and colored pencil on tracing paper, 23 7/8 x 33 3/4 in. (60.6 x 85.7 cm)





12. American System-Built Houses. Project, 1915–17. Perspective.
Ink and pencil on paper, 16 1/2 x 7 5/8 in. (41.9 x 19.4 cm)

13. Florida Southern College, Lakeland. Begun 1938. Aerial perspective.
Ink, pencil, and colored pencil on tracing paper, 24 x 47 5/8 in. (61 x 121 cm)