

**Enkeboll Foundation for the Arts & Architecture**

Sponsored Project:

**Architectural Restoration and Conservation (ARC) of Carved-Wood Interiors**

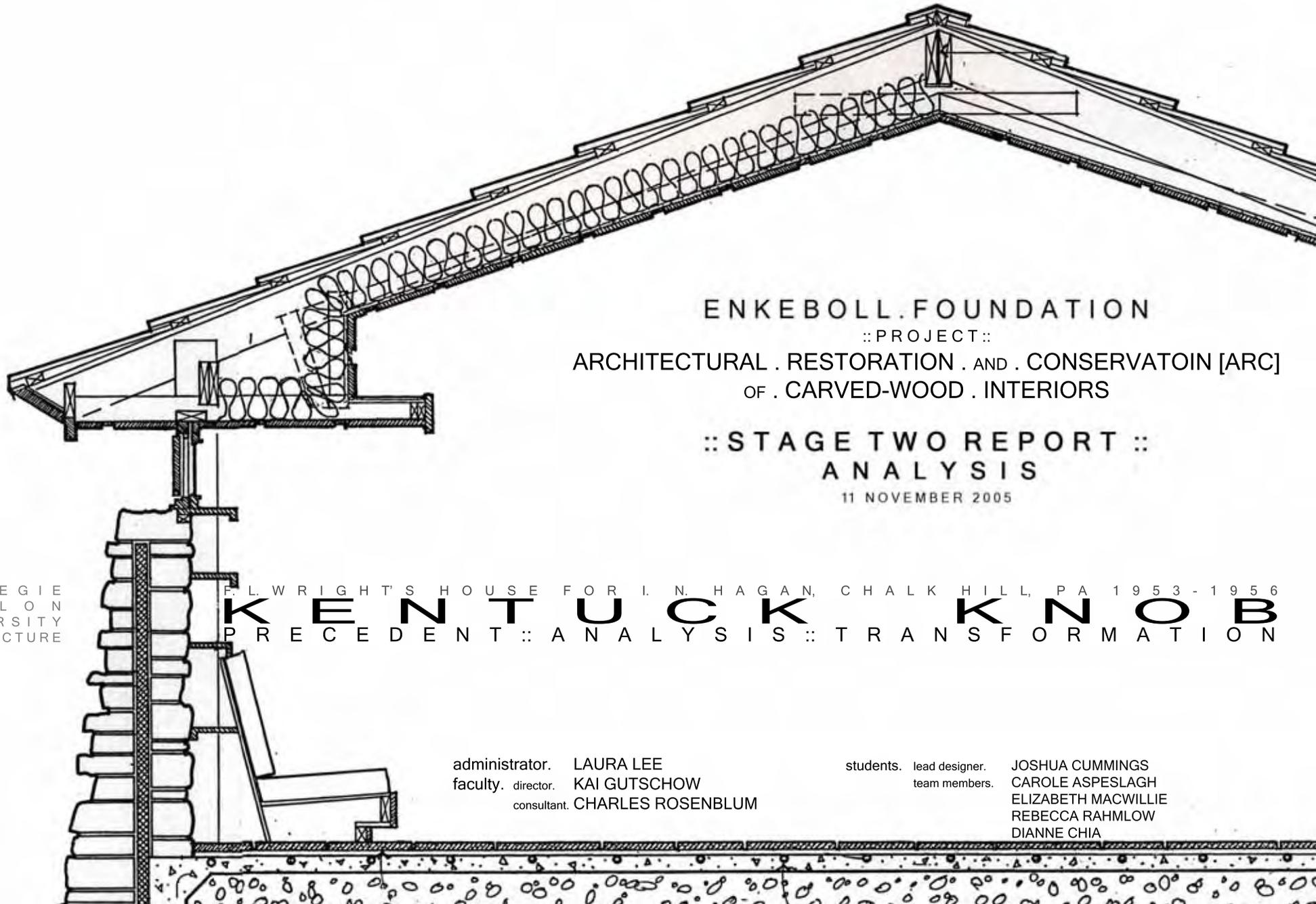
Final Report Volume 1

Carnegie Mellon University, School of Architecture

Administrator: Laura Lee

Lead Faculty: Kai Gutschow

Date: 11 November 2005



ENKEBOLL.FOUNDATION  
::PROJECT::  
ARCHITECTURAL . RESTORATION . AND . CONSERVATOIN [ARC]  
OF . CARVED-WOOD . INTERIORS

::STAGE TWO REPORT ::  
ANALYSIS  
11 NOVEMBER 2005

CARNEGIE  
MELLON  
UNIVERSITY  
ARCHITECTURE

F. L. WRIGHT'S HOUSE FOR I. N. HAGAN, CHALK HILL, PA 1953 - 1956

**KENTUCK KNOB**  
PRECEDENT :: ANALYSIS :: TRANSFORMATION

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PROJECT:  
**Architectural Restoration and Conservation (ARC) of Carved-Wood Interiors  
2004-2005**

“Re-Presentation, Analysis, and Transformation:  
Kentuck Knob as Case Study”

by Kai Gutschow

Architecture is a complex and multi-faceted field that lies at the intersection of many seemingly divergent concerns related to how humans shape the environment around them. It is both art and engineering; embracing both craft and concepts; reliant on both traditions and innovation; dealing with both macro and micro scales. Architects, as well as architecture students, are constantly challenged to bridge between these concerns, making their discipline by definition inter-disciplinary. Their best work often comes when the challenges to be overcome are greatest.

In architectural education, as well as the profession more generally, history and innovative design often seem to conflict. At least since the Bauhaus, a profound understanding of history, traditions, and the past has often been seen as an impediment to advancing the frontiers of our discipline, to expanding our understanding of the contemporary world, and to real innovation using the tools we have at our disposal to confront the future.

Carnegie Mellon University’s team of students and supervising faculty have used the “Architectural Restoration and Conservation (ARC) of Carved Wood Interiors, 2004-2005” project funded by the Enkeboll Foundation for Arts and Architecture as an opportunity to investigate and overcome this divide. For the past year we have worked in a systematic way from a deep understanding of history to the most cutting-edge design. The vehicle for this research was Frank Lloyd Wright’s little-known, but amazingly innovative house designed and built for the ice-cream magnate I.N. Hagan in nearby Chalk Hill, Pennsylvania from 1953 to 1956. The house was a near-perfect fit for our research:

- Pittsburgh: It is relatively close to our hometown of Pittsburgh and ten minutes from its world-famous cousin, Wright's "Fallingwater." Through field-trips, and the uncovering of a rich array of local archival and published resources, we were able to study this building in incredible depth.

- Wood: The house, including the structure, wall and ceiling paneling, much built-in furniture, and free-standing furniture approved by Wright, was built primarily of wood, yet maintained an interesting dialogue with hidden structural steel and a massive stone plinth upon which the house rests.

- Integrated Design: As a "total work of art," that straddles the best craft traditions of the past with innovative features of the American post-war context, the house provided a text-book example of a "integrated design," one of the primary goals of CMU's architectural education. Wright's "organic" design knit together in a seamless system every aspect of the house, from solar-orientation and site planning, to spatial and structural design, to the intricacies of carved window cutouts and skylight dentils made of wood.

- Hexagon: The house is planned using one of Wright's characteristic "unit systems." With an innovative and uniquely flexible hexagonal geometrical system which we analogized to DNA, Wright "grew" a masterpiece of profound order, incredible intricacy, as well as freedom and openness to the beautiful, natural site.

- Modern: When seen in relation to partner studies of the Baroque Rubens House in Antwerp, and Thomas Jefferson's Neoclassical Monticello, Kentuck Knob offered a desirable historical, geographic, and conceptual progression into the modern age whose connections to the past could be documented. Built amidst the dynamic atmosphere that was post-war American culture, it sat on the brink between tradition and modernity. The house featured both the most innovative technology and household gadgets and yet must be seen as part of an increasingly rare specimen of an all-wood house designed by a cutting-edge designer.

- F.L. Wright: The once-again increasing popularity of Wright's architecture assured that the project would have a rich array of scholarly sources, would be at least somewhat familiar to a wide range of the public, and would not remain in historical obscurity: this was a house we could help elevate to the level of one of the icons of 20th-century architecture. The "genius" of Wright as a designer assured us of a case-study with literally limitless potential for learning and understanding to ever greater depths every nuance of the house.

- Sources: Within the spectrum of Wright studies, the house has been relatively little studied, and yet two focused monographs have come out within the last year

which we feel we can contribute to a better and deeper understanding of the house, the design, and the many contexts that generated them.

- Reproduction: Much of Wright's furniture and woodwork has already been reproduced, adding a level of realistic hopes that potential future designs based on this work would be relevant in contemporary society and find wide appeal.

- Innovative Design & Fabrication: Wright himself was famous for challenging the norms of architecture, both in design and in the use of technology during the construction, as well as for the operation of the buildings. On the other hand, his architecture is so distinctive and "stylized," that young architecture students are naturally inspired to move in their own directions rather than copying forms or ideas. Both of these led naturally to wanting to explore today's most advanced design, modelling, and fabrication tools. Here history seemed to inspire innovation.

- Teaching & Learning: All of the above, made the house a perfect case-study both for teaching undergraduate architecture students, and for students to explore with eagerness and constant amazement.

CMU's "ARC" investigation began in the Spring 2005 semester with a special "project course" that sought to bridge between history and design courses in our school. "Frank Lloyd Wright: Precedent, Analysis & Transformation," taught by Kai Gutschow, who has both a professional background in architectural design, and a doctorate in modern architectural history, was a rigorous architectural history course that sought to understand and learn from the design principles of F.L. Wright through a case-study method. After a survey introduction to the career and bibliography of F.L. Wright and investigations of several important houses from throughout his career, the class selected Kentuck Knob as the historical house to analyze and work with in detail for the rest of the semester. The group of 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup>-year architecture students moved from understanding and "re-presenting" the house, to "analyzing" both the house and the context that generated it, and finally explored a "transformation" of what they learned in the design of a completely new object, often related only very tangentially to the historical house. The constant theme of the course was to more fully understand a design of F.L. Wright's, especially the interior woodwork, much of which is carved in an abstract, modern manner, and see if it was possible to uncover "design principles" or "systems" that act like a "kit of parts." A concluding phase of the course investigated briefly how these principles might be used to generate or "grow" new designs through various transformations.

A second phase of the larger research project saw several students staying on as

a summer job to analyze in much greater depth, and through innovative analytical and communicative tools, the intricacies of Kentuck Knob's design. In order to maintain some parallel with a study by a partner team studying the Rubens House in Antwerp, Belgium, we decided to focus exclusively on the living room, one of the great interior spaces of modern architecture, and made primarily of cypress wood. We gathered all available resources, and using the innovative section through the main space as a way to focus, we investigated six specific architectural highlights that we felt were instrumental in creating the seminal experience of the house. Students were constantly challenged to look harder, to find interesting parallels in modern architecture, and to challenge the tried-and-true but often tired methods of architectural "analysis" that pervade tools they most architectural design studios. Through an intense, highly iterative process of seeing, modeling, presenting, and critique, the team created a model of architectural analysis that will soon be transferred into CMU's 2<sup>nd</sup>-year design curriculum. The results were presented in an array of over 120 11"x17" plates in the 2<sup>nd</sup> meeting of the Belgian and CMU research teams, where they elicited much discussion and encouragement to continue.

A final phase of the 2004-2005 ARC project took place during the first two months of the fall semester at CMU. A new batch of students joined a few students that stayed on from the spring and summer teams, to add new life and many new ideas to the process at the crucial moment when we turned from analysis to "transformation" and design. Each of the students was challenged to find diverse and interesting methods of building on the analysis of Kentuck Knob. Students brought many different levels of training, including a wide range of computer modeling and design tools they felt comfortable with, and a refreshing variety of knowledge and focused interests in specific aspects of the house. We worked at first without any restraints: there was no required site, no program, no scale, no aesthetic. The only requirements were that they create something that at least conceptually could be tied back to Kentuck Knob. After several iterations, the team came to increasing consensus about what they wanted to design: a "seating opportunity" for the rear-year of Kentuck Knob, though even that moved from the back terrace, to the "brow" of the hill just beyond. With often conflicting agendas, the students eventually agreed that although their designs could be innovative and appropriate in so many ways, we wanted to engage in the contemporary debates about computer aided design and rapid prototyping technologies that so many students, schools, and firms are creating revolutionary architectures. The project funding and original analysis assured a continuous focus on wood, and a relationship to Wright.

Maneuvering the diverse pressures of life as an architectural student, four students maintained the kind of sustained and creative intensity that led to the design of four very different though highly innovative approaches and designs for “seating opportunities.” Two students decided to focus on the potential offered by a small laser-cutter that was made widely available to our team. Using Form-Z, Maya, AutoCad, as well as hand sketching these students were led to designs that featured an intricate array of parallel planes, as only a laser cutter could create. This Enkeboll-funded project was instrumental in getting CMU undergraduate architecture students access to a small laser cutter, releasing pent-up demand, and feeding hopes and ambitions for more, bigger, and more advanced machines. Two other students were intrigued by the more dynamic spatial complexities that Maya software is able to help architects realize. The resulting forms offered completely new ways of understanding the potential of some of Wright’s design ideas, particularly his use of the “Hagan Hexagon.” These designs went challenged and eventually went far beyond the rapid prototyping resources available to CMU students. A milling machine, a 3-D scanner, and other technologies might in the future offer the students to create models of their complex forms, and ideally life-sized constructions.

The students and faculty are eager to continue the explorations of the past year. After absorbing the lessons of the different designs, the plan is to come to a consensus and use team-work to design a single object in much greater detail, placing into greater focus the complexities introduced into any design when confronting the unique properties of wood, when inventing new means of connections and joinery, when introducing issues such as cost, available manufacturing technologies, ergonomics, location, and weather. The team expects to use the spring 2006 semester to design and build a life-sized “seating opportunity” and bring it to the attention of the owner of Kentuck Knob, the famous art patron and connoisseur Lord Peter Palumbo, in the hope that he might let students place their innovative design on the site, in the context of the famous historical house. Eventually, more focused research, re-presentation, analysis, and transformative design will lead to the publication of journal articles in the architectural and educational press, to a museum exhibit and catalogue, and to books that could inspire architects and the profession to look to history one of the means of innovating.

This report should serve as a document and proof of both the thorough and innovative work achieved by the CMU students on all three phases of the ARC project--representation, analysis and transformation--, as well as promise that even richer work would develop with additional time and technological resources.

PROJECT:  
**Architectural Restoration and Conservation (ARC) of Carved-Wood Interiors  
2004-2005**

- GOALS: To increase the awareness and understanding of carved wood.
- To publish existing applications leading to new solutions of carved-wood elements
  - To develop guidelines and techniques for the restoration, conservation and duplication of carved wood elements and interiors
  - To inspire the creation of innovative wood-carved elements and interiors based on traditional methods, automated manufacturing, and/or state-of-the-art digital technologies
  - To develop a research strategy that insures both in-depth analysis as well as broad understanding of wood-carving by integrating a case-study method with collaborative and comparative research by an international group of research teams.

PROJECT OVERVIEW:

The project begins by reviewing existing Enkeboll elements and product lines, in order to focus and guide the selection of three cases, known as “period residences” in the region of each participant. Cases will be selected according to various criteria, including proximity and access to research materials for each participant, and the desire to span broad historical as well as regional variations to insure rich comparative work. The wood-work in each case is to be both exemplary of the historical context in which it was created, and full of potential for contemporary investigation and possible future production. The particular case selected by each participant will reflect the specific nature of the research investigation, from “Restoration and Conservation” as well as “Duplication” of existing carved-wood elements using new techniques and automated technologies, to the “Manipulation” of existing patterns in order to create new carved-wood elements and systems.

A three-step research and creation process will guide each participant team in a similar manner from a text-based “Re-Presentation” of the case, to image-based “Documentation and Analysis,” to object-based “Production.” Stage I will involve the “Re-Presentation” of the history of each case based on a common case-study template for all three residences, moving from the general historical

context of the building to the detailed description of all the building's elements, especially the carved wood-work. Stage 2 will document and analyze each case primarily through images, including measured drawings, photographs, and analytical drawings that will address issues of formal typology, design intentions, production methods, as well as the meaning and experience of the building elements and woodwork. The research results of each participant begin to diverge according to the particular research focus mentioned above. However, the emphasis for all participants will remain both documenting the existing wood work and expanding our understanding of the historical work through innovative analysis that will lead to creative production. Based on the results of this work, a Stage 3 could pursue the development of new techniques and technologies for new carved wood elements and product lines by the Enkeboll Corporation.

#### RESEARCH FOCI:

Restoration and Conservation of Existing Wood Elements based on Traditional Methods, using New Techniques (Antwerp)

Duplication of Existing Elements Using Automated (Rapid Prototyping) Systems (NCSU)

Transformation of existing patterns and Creation of New Carved-wood Elements and Systems (CMU)

#### RESEARCH PROCESS

Stage 1: Re-Presentation (text): Selecting and Writing Case Studies

Stage 2: Documentation and Analysis (image): Inventory of Wood Parts, Preparation of Measured Drawings, and Innovative Analysis and Comparison to insure Greater Understanding of each Element and its Role in the Overall Design

Stage 3: Production (object): Proposal for New Techniques, Elements and Product Lines for Enkeboll

#### HYPOTHESIS

By thoroughly documenting, creatively analyzing, and selectively comparing wood-work from a three very different eras and three very different regions, we can gain both a deeper understanding of the particular, exemplary nature of each historical case study, and a broader, more creative sense of how this case study can inform contemporary practice and production.

Enkeboll Foundation

Project:

Architectural Restoration and Conservation (ARC)  
of Carved-Wood Interiors,  
2004-2005

**STAGE I Report**

Carnegie Mellon University, School of Architecture

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Date:

11 November 2005

PROJECT:  
**Architectural Restoration and Conservation (ARC) of Carved-Wood Interiors  
2004-2005**

“Culture and Context at a Wright Angle:  
Historical Background for Kentuck Knob”

by CHARLES ROSENBLUM

## **CULTURE AND CONTEXT AT A WRIGHT ANGLE: HISTORICAL BACKGROUND FOR KENTUCK KNOB**

### **The United States of America After World War II**

The United States in the 1950s experienced great prosperity and optimism that found expression in a culture of contradictions. Much of mainstream culture reveled in conformity, though certain expressions of American individualism, also came to the fore. Likewise, in a period of unsurpassed superpower status, the United States still gave voice to occasional articulations of inner doubt, dissent and turmoil. Due in large part to its massive industrial power and brutal atomic weapons, the United States defeated Japan and Germany in World War II. This astonishing victory resulted in a national sense of euphoria and hopefulness that was a welcome change to an exhausting war and the preceding Depression. A largely earnest and hardworking citizenry, later known as “the Greatest Generation” for its role in winning the war, had come of age during these trying years. It emerged in peacetime eager to take advantage of the American Dream. Said one veteran in the acclaimed oral histories of reporter and writer Studs Terkel, “The war changed our whole idea of how we wanted to live when we got back. We set our sights pretty high. All of us wanted better levels of living.”<sup>1</sup> This meant freedom and prosperity as well as the specific goal of home ownership.

Returning at last from overseas, millions of soldiers helped unleash gigantic economic demand. The G.I. Bill made college educations and home ownership accessible, and large scale wartime industries were eager to convert to new civilian uses. Though these often led to advances in electronics, material sciences and healthcare, much of the energy went into new consumer products. These phenomena, along with an end to wartime restrictions and rationing, led to explosive economic growth. While some benefits spread overseas through the Marshall Plan, which helped rebuild war-torn Europe and Japan, the U.S. economy focused largely on selling new products to consumers with increased discretionary income.

Specifically, the economic surge led to expansion in the suburbs. To promote the construction and sale of as many new homes as possible, government, industry and popular culture coalesced to promote an idealized image of American life—a nuclear family of a husband and wife and two or three children, living in a house in the suburbs with a tidy green lawn and at least one automobile. The lawn would be maintained with a power mower and chemical treatments. The car would be the



Levittown (1947+)  
Bucks County, Pennsylvania

latest model, to be replaced frequently. And the house would be filled with labor saving devices. Popular appliances “included Maytag’s matching automatic electric washer and dryer, otherwise known as the Supermatics. The steam iron, coordinated plastic tableware, the electric can opener, and the four-slice toaster enjoyed increasing favor.”<sup>2</sup> Not incidentally, stereotype dictated that the grey-suited husband commute to work every day to an anonymous office tower in the city while his wife stayed at home in the convenience-laden home.

These cultural and social shifts necessitated a departure from the confining multifariousness of the city, where extended families and multi-unit housing had frequently been quite common. Real estate developments fitting the new model spread rapidly across the countryside, overtaking farmland and surrounding or effacing traditional towns. During the 1950s, the country’s twenty largest cities grew in population by only .1 percent, but their suburbs increased by 45 percent.<sup>3</sup> The new suburban development consisted exclusively of single-family homes—no sidewalks, multi-unit housing or public buildings. At its periphery there developed a new retail culture of the roadside strip. Discount stores, fast food restaurants, drive-in theaters, motels and even schools were built to be accessible from highways and surrounded by plenty of free parking. This era of development gave the world that uniquely American invention, the shopping mall, which was supposed to be an improvement over the age, complexity and grit of the traditional downtown.<sup>4</sup> The television, a pre-war invention, gained widespread popularity during this time and helped spread the gospel of suburban living through stereotype-laden programming and exhortative corporate advertising. The Levittown developments, beginning in 1947 in Bucks County, Pennsylvania and Long Island, New York epitomized this era through acre after acre of nearly-identical Cape Cod style houses--the image of conformity, a turn toward the nuclear family and away from public life. “No man who owns his own house and lot can become a Communist,” William Levitt frequently opined. “He has too much to do.”<sup>5</sup>

Overall, the reassuring image of conformity and security that the suburbs offered was supposed to represent the American Dream, but it was also a reaction to the greatest American fear of the era: Communism and its attendant threat of nuclear war. Victory in war had made the United States an acknowledged superpower, but the Soviet Union held it in adversarial balance through the threat of both conventional war and nuclear weapons. The United States fought a very real war against Russian-backed North Korean and Chinese communists to a stalemate on the Korean Peninsula. At home, Senator Joseph McCarthy used witch-hunt tactics

to bully and extort primarily the innocent until he was censured by the United States Senate. Unsubstantiated fears of shadowy Communists were as powerful a motivating force in politics and culture as the very real nuclear weapons that the superpowers aimed at each other.

Meanwhile, suburbanization, though widely embraced, had profoundly negative effects on American cities. The departure of taxpaying homeowners by the thousands strained city finances and forced reductions in municipal services, but so-called improvements were even worse. To cater to the new culture of the automobile, many cities undertook programs named Urban Renewal that really involved destruction on a large scale. Inner cities were leveled and reconstructed, criss-crossed by massive highway construction that allowed executives in their shiny new cars to drive conveniently to increasingly corporate downtowns from homes in the suburbs. "This is not the rebuilding of cities. This is the sacking of cities," declared an outraged Jane Jacobs in her classic book, *Death and Life of Great American Cities*.<sup>6</sup> Meanwhile, a consortium of automobile manufacturers, oil companies and tire makers actually conspired successfully during this period to purchase light rail lines in Los Angeles and shut them down, eliminating competition for automobiles. Another obvious and ugly but largely unspoken truth behind much of this destruction was that it took place along racial lines. Poor African Americans were segregated, forcibly displaced and then segregated again. Such actions were only part of the impetus for the Civil Rights movement among African Americans, which gained national attention with the African American boycott of segregated buses in Montgomery Alabama in 1955.

American culture of the period suffered from the nation's naiveté, but it also benefited from a soaring optimism. As if to affirm the appropriation and reformulation of European culture, American Abstract Expressionism, with its genesis in Lower Manhattan, rose to the forefront of the art world. Artists including Willem de Kooning and Jackson Pollock used personal artistic gesture and pure abstraction both to peer into the depths of the human psyche and to assert implicitly that the universal man was an American. Similarly, jazz musicians including Charlie Parker, Dizzy Gillespie and Thelonius Monk developed bebop, the furiously expressive yet cerebral iteration of jazz, America's original music. The less artistically ambitious could listen to Elvis Presley's rock and roll, whose combination of country music with rhythm and blues became hugely popular with an increasingly visible and influential younger generation. Some expressions of culture hinted at the less savory aspects of the American experience. Arthur Miller's *The Crucible* was a direct indictment of the

tactics of McCarthyism. His *Death of a Salesman* showed how the changing nature of a superficial consumer economy could crush the individual in American society. Protagonist Willy Loman laments that he has little of value beyond his life insurance policy. “After all the highways, and the trains, and the appointments, and the years, you end up worth more dead than alive.”<sup>7</sup>

American society and culture of this period benefited from the nation’s optimism and suffered from its naiveté. Even within a greater culture of conformity, there was enough esthetic creativity and value placed on individualism that the American landscape could provide room for experimentation and expression in domestic architecture. Extensive suburbanization, for its many disadvantages, also promulgated a new generation of architect-designed homes in which modern architecture allowed artful manipulation of space, intelligent use of materials and a sensitive relationship to the landscape to elevate living to a refined level. A new proliferation of both “shelter” magazines and more specifically architectural periodicals used the work of architects and interior designers to promote good design and increase the popularity of designer furniture and fine art. A house such as Frank Lloyd Wright’s Kentuck Knob takes its place between the extremes of conformity and expression in individual esthetic values that drive architectural design.

### **Other Architectural Trends in the United States**

To a large degree the 1950s were characterized architecturally by the increasing popularity and the simultaneous questioning of European Modernism, often known in the United States as the “International Style.” The term and style came to the United States in 1932 through an exhibition at the Museum of Modern Art, curated by Philip Johnson and Henry-Russell Hitchcock, that also traveled to numerous cities throughout the country.<sup>8</sup> It introduced and elevated the leaders of European Modernism, especially Mies van der Rohe, LeCorbusier, J.J.P. Oud and Walter Gropius. The exhibition grouped these designers on the basis of their freely asymmetrical planning, hard-edged white articulation and lack of ornament, as seen in buildings of the 1920s. To Hitchcock and Johnson, the new architecture was not simply a desirable style, but a moral imperative. They published a popular book, *The International Style*, but their influence was limited at first. American architecture before World War II was exemplified by Art Deco Skyscrapers, Collegiate Gothic campus buildings and Colonial Revival Houses, though a handful of practitioners



860-880 Lake Shore Drive (1948-51)  
Chicago, Illinois  
Mies van der Rohe

including Richard Neutra, Albert Frey, the Keck brothers and Wright himself were building in modern styles with varying degrees of European influence.

After the war, conditions and tastes changed considerably. Many of the foremost European architects had come to America in the 1930s to flee the Nazis. Walter Gropius accepted an invitation to teach at Harvard, and Mies van der Rohe went to the Illinois Institute of Technology, where he both taught students and redesigned the entire campus. Other immigrants to the U.S. included Marcel Breuer and Erich Mendelsohn, as well as, for a time, Alvar Aalto. Certain of their built works in the United States preceded the war and signified their new positions as leading educators. The Gropius House of 1937 in Lincoln Massachusetts exemplified the Americanization of that architect's work, while Mies' first buildings at IIT foreshadowed a much larger architectural movement to come in the United States. His Crown Hall of 1956 epitomized the essentialized structure and open, universal space that Mies idealized. "Technology is far more than a method, it is a world in itself."<sup>9</sup>

Mies and his contemporaries were transformed from curiosities into paradigms after the war. Gropius, working with the Architects Collaborative, completed the Harkness Commons Dormitories at Harvard in 1948. He also influenced a new generation of Modernists including Philip Johnson, I.M. Pei, Edward Larrabee Barnes and Paul Rudolph. Johnson was a particularly effective disciple of the movement, promoting Miesian modernism through his influence with potential clients as well as through exhibitions, writings and buildings. His classmates became paradigmatic designers.

Mies van der Rohe, meanwhile constructed the 860-880 Lake Shore Drive apartments in Chicago and, with collaborator Johnson, the Seagram Building on Park Avenue in Manhattan. Clear reflections of Mies's dictum, "Less is More," these rigorous and austere projects set a standard for a generation of designers. Where the previous era of architecture had been free and eclectic, post-War America was almost exclusively Modern. Building types such as city halls and college campuses that had been built in historicist styles became proving grounds for the new Miesian modernism. Likewise, what had been the architectural style of European Socialism developed into the standard expression of corporate America. Rigidity and uniformity in architecture formed a message that America's giant financial and industrial corporations were all too eager to exemplify. It was also, not incidentally, cheaper to construct than the ornately palatial skyscrapers and train stations of a generation earlier.

Modern architecture was sufficiently hegemonic in the 1950s that a true ideological counterpoint was still a decade away. Nonetheless, numerous practitioners, while staying under the greater umbrella of Modernism managed to modify some of its precepts and stretch its boundaries. LeCorbusier was foremost among these. His revolutionary tract *Towards A New Architecture* continued to perpetuate the influence of the 1920s when it was written through an exhortative literary style that made appeals to rational forms and machine imagery. Still, his later buildings exhibited an increasingly personal, sculptural and monumental expression. His Unité d'Habitation was rational enough in its arrangement of painterly living spaces, but its constituent concrete was sculpturally expressive and the roof was an almost purely surrealist landscape. His Notre Dame du Haut in Ronchamp, France (1950-54) shocked much of the architectural world for abandoning the appearance of function in favor of spiritualism and monumentality in a sculpturally expressive vocabulary of tactility.

If one Modern master had veered toward expressionism, others were free to promulgate less radical experiments. Alto's Baker House (1947-9) at MIT showed that organic shapes and materials could soften the experience of a college dormitory, making normally abstemious modernism humane and comfortable. While Jose Luis Sert and others were writing about the need for monumentality in modern architecture, Louis Kahn demonstrated that a lingering influence of Beaux Arts planning and an abstracted echo of Roman ruins could contribute a welcome sense of spiritual grandeur that seamlessly synthesized the rigor of function. Kahn declared, "In the nature of space is the spirit and the will to exist a certain way. Design must closely follow that will."<sup>10</sup>



Baker House (1947-9), M.I.T.  
Cambridge, Massachusetts  
Aalvar Aalto

### Houses of the Era

The single family home might have been a commodity for real estate developers and a blight in its cheapest and most poorly planned forms, but for architects in the 1950s, the building type enjoyed a heyday in which Modern efficiency blended with singularly American qualities of leisure and comfort in high design. While Kentuck Knob is quite specific to the philosophy, approach and style of Frank Lloyd Wright, it also fits in well with a profusion of architect-designed Modern houses of the era. Henry-Russell Hitchcock announced triumphantly in 1953, "Today there is no further need to underline the obvious fact that what used to be

called 'traditional' architecture is dead if not buried."<sup>11</sup> While he apparently overlooked the millions of Cape Cod and Colonial Revival houses in the suburbs, he was nonetheless largely correct about high-style architecture, which was making considerable inroads in residential America. Within this context, Wright was also at a career peak. Hitchcock called Wright "Our own greatest master...now in his eighties and more active than ever...not only honored throughout the world but also at home."<sup>12</sup> The prosperity of post-War America allowed the hegemony of Modern architecture, but it was characterized by a variety of subcategories of which Wright's work was only one.

American architecture embraced Modernism, but not always with the intellectual clarity or purity of approach that characterized many Europeans. A house such as George Kraetsch's Butler House in Des Moines, Iowa (1934-6) shows how pre-War versions of American Modernism often reflected the compositionally ambitious but academically lax dynamism of the Machine Age. Located on an eleven acre hilltop site outside the city, the Butler House is 13,000 square foot poured-in-place concrete structure with a steel frame. The house has the pointed prow and curving walls of an ocean liner, complete with flat section aluminum rails. Its exterior walls are smooth and unadorned, with the exception of four parallel "speed lines" which run horizontally above the windows on different floors to serve as an abstracted cornice. "Surplus materials for decorative purposes are totally lacking," Butler declared, "as I believe that simplicity and good design are much more restful and inherently beautiful in a home."<sup>13</sup> The house is arranged fairly freely on an east-west axis, though two long switchback ramps cut perpendicularly through the whole house, connecting 28 rooms at seven different levels. Hardware, fittings and lighting fixtures reflect the exuberance of a client obsessed with the best available products of the Machine Age. The whole structure is topped with a library and an outdoor fireplace whose cheerful cubistic form reflects the massing of the house. Though far from the rigors of the International Style, this structure reflects the cheerful and adventurous geometries and a singularly American approach to Modern architecture.

Buckminster Fuller's Dymaxion House of 1945-6, now located in Dearborn, Michigan is a particularly eccentric architectural expression that reflects certain utilitarian obsessions of its designer. It was also very notorious, if not palpably influential. Originally conceived by Fuller in 1927, the Dymaxion House was intended to make domestic construction and living economical and convenient. "The



E. E. Butler House, (1937)  
Des Moines, Iowa.  
George Kraetsch



Dymaxion House (1945)  
Wichita, Kansas  
Buckminster Fuller



Eames House (1948-9)  
Pacific Palisades, California  
Charles and Ray Eames

house is designed throughout to eliminate *having* to do things," *House & Garden* announced. "All equipment is designed to reduce physical drudgery to a minimum."<sup>5</sup> Leaping past conventions of tradition and academic architecture, Fuller designed a cylindrical structure with a steel frame and airplane-like aluminum skin. Significantly, earlier design studies explored hexagonal geometries. In the built version, a core of stainless steel tubes rooted in a concrete foundation formed the center of the structure, while the frame cantilevered outward like the branches of a tree. With a diameter of only 36 feet, the house was, by necessity, a study in space-saving devices. Hyper-efficient conveniences included rotating shelves, a pivoting closet, and a once-piece metal bathroom. Offered at a bargain price of \$6,500 in 1945, the house received 37,000 orders after a favorable *Life Magazine* article. One biographer lamented, "Whether consumers would be willing to accept its elegant, aeronautical aesthetic on a daily basis was never put to the test, as the project was aborted in development stage before it ever reached the marketplace."<sup>14</sup> Only one Dymaxion House was ever built.

The Eames House and Studio by Charles and Ray Eames of 1948-9 in Pacific Palisades, California, reflects similar obsessions with industry and economy in a home that was also widely publicized. Though modified considerably in its final form, it began as Case Study House #8, published as part of the series of breezy modern domestic designs in *Arts & Architecture* magazine.<sup>15</sup> In contrast to the quirky aeronautical feel of Fullers' work, the Eameses used mechanically produced pieces in the service of a high esthetic standard. On a wooded site overlooking the Pacific, the house and studio is a two-story, 1500 square foot glass and steel box. Composed entirely of ready-made parts from catalogues assembled in a clear and light-weight structure, it embraces the technology of industrial production as well as the esthetic possibilities of composition, color and materials in an effective synthesis. Its straightforward rectilinearity has the color and proportion of a de Stijl painting. Charles Eames commented, "It is interesting to consider how the rigidity of the system was responsible for the free use of space, and to see how the most matter-of-fact structure resulted in color and texture."<sup>16</sup> The interior with double height volumes is filled with furniture and objects that the couple had both designed and collected made the house a pilgrimage site among esthetes. The Eameses made a film of the home in 1955, *House: After Five Years of Living*. Most recently, the house has been given over to a foundation to preserve the Eameses' architectural and design legacy.<sup>17</sup>

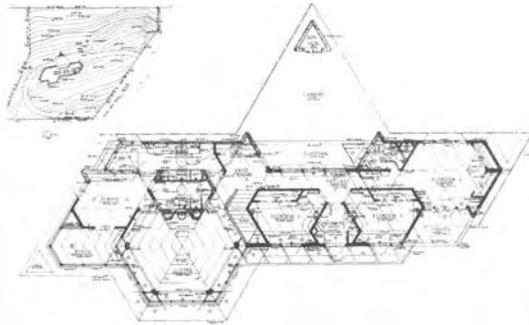


Dr. Edith Farnsworth House (1946-51)  
Plano, Illinois  
Mies van der Rohe

One of the most definitive houses of this period is Mies van der Rohe's Farnsworth House in Plano Illinois (1946-51), Mies's only private home in the United States, and one of his most pure designs. On the other hand, Dr. Edith Farnsworth, a close friend of Mies who commissioned the house, clashed with the architect, and the two sued each other.<sup>18</sup> Meanwhile, the house suffered from mosquitoes and flooding as well as other signs of impracticality. None of this seems to matter. The austere and elegant pavilion has become an internationally recognized emblem of Modern architecture. It seems to affirm that the ascetic discipline of Mies's office and residential towers could achieve an apogee of luxury and elegance when expressed as a single family retreat. Beinahe nichts—almost nothing. “This small house has much to say about the way in which Mies strove for universal space where man could find ultimate meaning from within himself.”<sup>19</sup> A flat open entry platform leads to the portico of the house, which is itself a horizontal roof plane suspended above a horizontal floor plan. The primary structure of eight vertical steel beams lifts the living spaces about five feet above the wooded flood plane. Continuous glass enclosure, with strategically spaced curtains ensures expansive views through the river valley. A central service core defined by a kitchen and two bathrooms separates dining and study spaces near the entry portico from the bedroom at the rear of the house. While many other Modern houses were designed in this period, seemingly none of them is this rigorous.

Partly because he was in practice for so long, Frank Lloyd Wright lived to see generations of architects who were influenced by his work. Paul Rudolph was a singular case, who drew inspiration from Wright while reflecting other influences as well. He opened his office in 1952 and became a rising star in the Sarasota School.<sup>20</sup> His Burkhardt House in Casey Key, Florida, exemplifies how a Wrightian sense of planning and planarity could be synthesized with a Miesian approach to elegant and austere structure, resulting in houses that were ideally suited to their warm climate. The Burkhardt house is a 4000 foot structure sited on a barrier island and built as a vacation home for a German businessman. Forming a T in plan, it has the clerestory windows and the rhythmic composition of cantilevered overhangs that characterize some of Wright's best Prairie Houses, perhaps the Avery Coonley Playhouse. At the same time, the wooden post and beam structure is linear and taut. Also, the concrete block and expansive glass infill give a sense of both restraint and airiness.

Other practitioners were more direct followers of his work. Peter Berndtson was a Wright apprentice in the early 1940s, who moved to Western Pennsylvania



Douglas House (1962)  
Robinson Township, Pennsylvania  
Peter Berndtson

with his wife, architect Cornelia Brierly in 1946. Both together and separately, they built houses that unapologetically followed Wright's principles with high degrees of fidelity and skill. In the Douglas House (1962-5) in Ross Township, a northern suburb of Pittsburgh, designing alone, Peter began with a hexagonal module, an organizing principle used by very few architects other than Wright, and executed a masterful example of organic architecture. Sited on a sloping, wooded site, the house is arranged on an east-west axis so that it faces downhill. A driveway curves around to the back of the house and a triangular carport, where the entry point is the conjunction of the kitchen/living/dining wing to one side and the bedroom wing to the other, in the fashion of Wright's Usonian houses. The living room is a grand hexagonal space lined with built in furniture and supported by angled brick columns. A massive fireplace anchors the space visually and connects it to the utility core and kitchen. An east-west hallway leads down the line of two regular bedrooms and their bath, each in the shape of an irregular hexagon, leading to the larger hexagonal master bedroom with its terrace. Throughout the house, custom furnishings reflect the hexagonal module, while moldings in the ceiling emphasize the flow of space. Although this house was built after Wright's death, he praised Berndtson's other works on visits to Pittsburgh.

Not all Modernist residential work of this period reflected Wright's influence. Louis I. Kahn's Esherick House (1959-61) in Philadelphia, Pennsylvania reflects his search for a timeless and serene monumentality that also works in subtle service to the comfort and humanity of its inhabitants. Kahn was an unapologetic Modernist with educational roots in the Beaux Arts and an appreciation of ancient ruins that was reinforced on a fellowship with the American Academy in Rome. These sensibilities inform the Esherick House, which appears from the street as a nearly solid sharp-edged concrete rectangle broken only by a chimney and two severe window slits in the middle. The interior and other facades reveal in contrast a high degree of responsive openness. Spacious living and dining spaces on the first floor (with a more compact "servant" zone for kitchen and laundry) are divided by a central stair. A precise vocabulary of square and T-shaped windows allows appropriate degrees of privacy and panorama. An interpenetrating rhythm of vertical and horizontal structural elements helped define private and public spaces with richness.

Frank Lloyd Wright may have struggled in parts of his career to advance the use of Modern architecture. Likewise, the movement may have developed in the United States with some characteristics that he found unappealing. Nonetheless, the 1950s found him practicing in a context that appreciated a well-designed modern

house. It embodied a set of design challenges that had preoccupied him for a lifetime in architecture.

### **Frank Lloyd Wright**

America's best known and most highly revered architect,<sup>21</sup> Frank Lloyd Wright straddled the nineteenth and twentieth centuries chronologically, while also synthesizing some of the great issues of those two eras. From the earlier period he took a romantic sense of the power of nature as an esthetic, moral and even religious force. Wright's work parallels the characteristically nineteenth-century romanticized celebrations of nature and individualism found in the writings of Walt Whitman, Ralph Waldo Emerson and Henry David Thoreau. He also embraced notions of abstraction of mechanism and space that were characteristic of the twentieth century, but in these respects, he was as much an innovator as a follower. Wright insisted, not so accurately, that he was a singular creative force with few sources or antecedents, though he did admit the influence of architectural theorist Eugene Emmanuel Viollet-le-Duc and his mentor, Louis Sullivan. In his seventy-year career, Wright went through changes of style and motif as well as highs and lows of popularity. Nonetheless, his commitment to this particular combination of issues as articulated in his organic architecture remained consistent throughout. He was, above all an exponent of architecture's power to express the human condition artistically. "[I]t was his life-long intention to form human life into rhythmic patterns which seemed to him poetic and to embody those patterns in buildings which were in every case specific and unique poetic works themselves."<sup>22</sup>

Born in 1867 in Richland Center, Wisconsin, Wright was the son of an itinerant preacher-musician father and an overbearing school-teacher mother. He absorbed many character traits through his family and childhood experiences. His mother legendarily determined in his childhood that he would be an architect, and exposed him to the Froebel toys that impressed him as a child and affected his later work, forming "the modular system that has been back of every design I ever made."<sup>23</sup> But he was also a lifelong pianist who boasted, "If I wasn't the world's greatest architect, I would have been another Beethoven."<sup>24</sup> Growing up, he spent considerable time on the Wisconsin farm of the Lloyd-Joneses, his mother's family. There he learned a reverence for nature and farm labor that was reinforced by his

uncles who were zealous Unitarian ministers. Their family motto, “Truth Against the World,” he took as his own.<sup>25</sup>

Wright studied engineering at the University of Wisconsin for barely a year before making his way to Chicago to work as an architect. After a brief period in the office of the successful but undistinguished J. Lyman Silsbee, Wright found work with Adler & Sullivan, one of the city’s most distinguished firms. Adler & Sullivan were prospering as Chicago experienced rapid growth of burgeoning industry and trade, as well as the ongoing rebuilding after the 1871 fire. With Adler’s engineering acumen and Sullivan’s design expertise, the firm was able to develop a new architectural expression for the high rise office building, a type that Sullivan would famously state, “It must be every inch a proud and soaring thing, rising in sheer exultation that from bottom to top it is a unit without a single dissenting line,— that it is the new, the unexpected, the eloquent peroration of most bald, most sinister, most forbidding conditions.”<sup>26</sup> Wright became Sullivan’s close collaborator, working on such projects as the Wainwright Building (1890-1) in St. Louis and the Charnley House (1891) in Chicago. During this period Sullivan also achieved acclaim for his ornament, which combined underlying geometric structure with interweaving foliate designs in a personal and original fashion that had certain formal similarities to Art Nouveau.<sup>27</sup> Wright would later apply the principles found in Sullivan’s ornament to a more holistic approach to materials and spaces in architecture—organic forms with an underlying geometric structure. Though Wright left Adler & Sullivan in anger in 1893, he always referred to Sullivan as “Lieber Meister” and considered him one of very few architects whose influence and significance he would actually acknowledge.

Though designs such as the Winslow House (1893) in River Forest, Illinois showed early manifestations of abstract form and freely flowing spaces, Wright’s real paradigm shift in residential design came with the so-called Prairie Houses, the earliest of which was the Ward Willitts House (1900-2) of Highland Park, Illinois. Other eminent examples include the Darwin Martin House (1904) in Buffalo, New York and the Robie House (1906-9) in Chicago, Illinois. Wright liked to argue that the Prairie House came simply from nature and his mind. “To Europeans these buildings seem uninhabitable,” he wrote. “But they derive height and air by quite other means and respect an ancient tradition, the only one worthy of respect—the prairie.”<sup>28</sup> The houses are characteristically horizontal in profile with wide overhanging eaves, paralleling the flat ground and making what can be massive houses seem very low and sheltering. Portes-cocheres and garden walls expressed a symbiotic reach into the landscape. Likewise, their plans emphasize the continuity



Darwin Martin House (1904)  
Buffalo, New York  
Frank Lloyd Wright

of space, with flowing transitions rather than walled divisions between rooms, “breaking the box,” in Wright’s terms. The hard edges and crisp surfaces of these structures were revolutionary in many senses, but Wright drew some inspiration from Japanese architecture, from study and travel as well as examples such as the Ho-o-Den pavilion at the 1893 World’s Columbian Exposition in Chicago.

Wright’s Prairie Houses were influential in many arenas. He published designs in domestic architecture magazines including *Architectural Record* and *Inland Architect* at the same time that he had designs in the so-called “shelter” magazines, such as *Ladies’ Home Journal*, aimed at housewives.<sup>29</sup> Also, very significantly, two volumes of his work published by Wasmuth in Berlin brought his designs before a European audience, influencing the next generation of Modern architects such as Mies van der Rohe, Walter Gropius and LeCorbusier, some of whose early works show a direct influence.<sup>30</sup> In later years, Wright would claim to have worked single-handedly. In fact he was dependent upon associates and draftsmen. Also, he worked in a context of talented peers, even if he was the standout.<sup>31</sup> Marian Mahoney Griffin was instrumental in constructing some of Wright’s works of the period in his office. She and husband Walter Burley Griffin went on to other successes as architects. Architects including George Elmslie and William Drummond worked successfully in the Prairie Style. In his early days, Wright was happy to have such colleagues. Only in later years did he express resentment.

His ill feelings were due at least in part to scandal and tragedy. In 1906, Wright absconded to Europe with Mamah Borthwick Cheney, the wife of a client, leaving behind his wife, Catherine and six children. The subsequent scandalous newspaper headlines nearly ruined his reputation and career. Wright’s protests that normal laws of society did not apply to him as a great artist were not helpful. So the architect and his mistress retreated to the architect’s ancestral home in Wisconsin, where Wright built Taliesin (1911), his home and studio. This architectural tour de force advanced and transcended the ideas of the Prairie house with a more free-form plan, a more pure palette of materials, and a romantic, meandering relationship to the hilly farmland where it was sited. Tragically, though, a crazed servant burned the house and murdered Mrs. Cheney and a number of others. Wright seemed broken in spirit and professionally, his great architectural achievement dashed physically and further obscured by sensational newspaper accounts.

Wright retreated to Japan for a number of years where he worked on the Imperial Hotel in Tokyo, one of his largest projects. The building’s pylon foundation and cantilevered structure were outgrowths of Wright’s developing organic



Ennis House (1923-4)  
Los Angeles  
Frank Lloyd Wright

architecture. These features also helped the structure withstand the earthquake of 1923, which destroyed most other buildings nearby. Wright took this event as an affirmation of his architectural genius. “[I]n this triumph of integral character over destructive forces lies...those methods which were peculiar to myself in this work, the faithful execution of which protected it from destruction or damage.”<sup>32</sup>

Other observers were perhaps not so generous. During the 1920s, Wright produced some of the most sprawling and adventurous designs of his career, but most of them did not get built. St. Mark’s Tower (1929) for New York and San Marcos in the Desert (1928-30) for Chandler, Arizona remained on paper. A few houses in California, such as the Charles E. Ennis House in Los Angeles (1923-4) showed how a number of cultural influences were creeping into Wright’s work. He had studied and absorbed numerous lessons from the pre-Columbian architecture of Central America, as well as the American Southwest. Likewise, though he was loath to admit it, he had learned from various forms of Modern and Expressionist architecture that he had seen in Europe. Wright’s design sense was transformative, though, and only keen observation of later scholars could clearly identify European sources in his work.<sup>33</sup>

The early thirties seemed particularly bleak for Wright, as he had built almost nothing for a decade; the Depression quashed much of the building industry in the U.S. Wright continued to lecture widely, and he also wrote his autobiography, which spread his popularity, especially among students. Undaunted by the economy, he opened the Taliesin Fellowship at his rebuilt home and studio. With the aid of his third wife, Olgivanna Milanoff, a headstrong Montenegrin divorcee thirty years his junior, Wright welcomed a group of enthusiastic tuition-paying apprentices who were required to maintain Wright’s farm, cook his meals, and even chop his firewood, in addition to work in the architectural studio. Though initial critics found the Taliesin Fellowship populated with students who were “gullible enough to pay for the privilege of growing his food and repairing his estate,”<sup>34</sup> Wright actually cultivated an office that was to serve him very effectively until his death in 1959. Figures such as William Wesley Peters, his chief engineer, and Jack Howe, his chief draftsman, formed the core of the organization. Others such as Edgar Tafel, Bob Moshier, Allen Dombar and Aaron Green served key roles as draftsmen and project managers. Likewise, Wright sent a new generation of architects out into practice with training and ideals of the Taliesin Fellowship. These included John Lautner, Paolo Soleri and Peter Berndtson.



Herbert Jacobs House (1936-7)  
Madison, Wisconsin  
Frank Lloyd Wright

One of the greatest personal Renaissances of architectural history came out of this period in Wright's career. During 1935 and 1936, Wright received commissions for Fallingwater, near Mill Run, Pennsylvania and the Johnson Wax Building in Racine Wisconsin.<sup>35</sup> Each of these buildings was a virtuoso performance, marking "a high point in Wright's vast *oeuvre*, in American architecture, in the architecture of this century, and possibly in all architecture."<sup>36</sup> Fallingwater quite famously adapted the forms of the sandstone slabs of a waterfall to create cantilevered shelves of space projecting heroically over the falls. At Johnson Wax, an unconventional "lily pad" column was the structural module for an extensive complex of balconies, passageways and skylights. Each of these projects seemed to some observers like a response to the "International Style" exhibition of 1932 at the Museum of Modern Art. The show had embraced the new practitioners of Europe and had dismissed Wright as a has-been. Yet projects such as Mies van der Rohe's Barcelona Pavilion (1929) seemed particularly indebted to Wright's planning principles. With Fallingwater and Johnson Wax, Wright asserted that his organic architecture was as rigorous and abstract as his European rivals, while embracing a sense of materials and site that they often lacked.

During this period, Wright also developed the design of the Usonian House, exemplified by the Herbert Jacobs House (1937) in Madison Wisconsin). With economical construction of brick and boards and battens, topped with a simple flat roof, Wright intended to apply his spatial planning principles to living on a small and affordable scale. Wright claimed that the affordable house was a problem that he "would rather solve...with satisfaction to myself and Usonia than build anything I can think of at the moment."<sup>37</sup> At the same time, "Usonia" was Wright's vision for a sprawling and reconstituted settlement of the American landscape. During the 1930s, he began studies and models of Broadacre City, his idealized version of what new development would look like in the Usonian landscape. Under his vision, settlement would spread across the countryside, but do so organically, with farmland interspersed with homes, schools, towers and cultural facilities. Of course, all of these would be designed by Wright. Sadly, the developments that came to pass in the American landscape were dominated by Cape Cod houses and fast food restaurants. Nonetheless, through the Usonian house, Wright continually updated his notions of organic architecture as it would work for a typical American family in the suburban landscape.

Wright's work slowed temporarily during World War II as he articulated largely unpopular isolationist views and an unwise lingering fascination with Russia, but

not Communism. Also, he struggled to build with wartime shortages and the constant threat of apprentices getting drafted.

In the 1950s, though, he experienced the most prolific era of his career, even though he was in his eighties and nineties.<sup>38</sup> A number of projects that had evaporated as proposals in the 1920s came back to life. The high-rise St. Mark's Tower became the Price Tower (1953) in Bartlesville, Oklahoma. The Guggenheim Museum, which had been under design since 1943 finally reached construction (1957-9). Also, Wright designed a dozen or more houses each year. The Depression era economies of the earliest Usonian houses soon gave way to slightly more sprawling and luxurious manifestations of similar design principles. Wright designed a line of furniture for the manufacturer Henredon. He published a book a year through publisher Duell Sloan and Pearce. The architect who had been born two years after the Civil War lived long enough to appear on television and ride in helicopters.

In his last phase of life, Wright did not quite enjoy the hegemony of his rival modernists in universities or commercial structures, but his presence was significant, and he was perhaps more influential than his rivals as a residential architect. The persistent principles of his organic architecture had continuing relevance and appeal as solutions for living in the American landscape. Whether through the more zealous followers of the Taliesin Fellowship or through a new generation of over-enthusiastic merchandisers and sycophants, there is always a risk that Wright will be worshipped rather than studied. Still, in an era with renewed environmental concerns and continuing taste for sophisticated residential architecture, the architect is as relevant as ever. As Robert Twombly observed, "The more Wright is demythologized, the more satisfying he becomes."<sup>39</sup>

### **The Regional Landscape around Kentuck Knob**

Kentuck Knob is located approximately fourteen miles to the east of Uniontown, Pennsylvania in Fayette County. The house is sited at an elevation of just over 2000 feet, near the eastern edge of Chestnut Hill, a ridge at the western edge of the Allegheny Mountains.<sup>40</sup> These mountains are more like a network of ridges running roughly from southwest to northeast across the central part of Pennsylvania. They reach heights of up to 3000 feet above sea level, with valleys in between dropping fairly precipitously down 1500 feet or more. Kentuck Knob sits

high on one of the western most portions of the Allegheny mountains from which it faces east and looks back at the dramatic vista that they present. Within just a few miles down a long descent is the Youghiogheny River, where the small village of Ohiopyle is sited at a horseshoe bend. Tracks of the B&O Railroad run past, but the station stop is abandoned. The primary connecting road is route 381, which runs north and south, and near which Frank Lloyd Wright's Fallingwater sits just seven miles north. Route 40, a major east-west highway and historic route for travelers that long precedes automobile traffic, is about ten miles to the south.

The Kentuck name comes from a part of the surrounding township known as "Little Kentucky." According to local histories, David Askins, a pioneer settling the region after the Revolutionary War was headed for Kentucky.<sup>41</sup> Before he got there, he found that this part of Fayette County was sufficiently similar to what he expected from Kentucky that he elected to stay. His assigned moniker appears on maps as early as 1832. European activity in the area goes back further historically. Approximately ten miles away, Fort Necessity is the site of the first battle of the French and Indian War, which took place on July 3, 1754. There, the French defeated troops led by a 22-year-old George Washington, inaugurating a seven year world war in the pre-industrial era of armed conflict.

Nearby Uniontown was founded in 1783. The oldest surviving architecture in the region consists of a few stone houses from this period. Other settlement followed through the nineteenth century as coalmines and coke ovens opened to serve the heavy industry of Pittsburgh. Nonetheless, the area maintained a frontier mentality and an isolated rural feeling that survives to this day, even in the presence of skiers, hikers and white-water rafters who come to the areas various resort locations. Generations of technological and institutional "firsts" in Pittsburgh and the surrounding area of western Pennsylvania were often touted as the first such thing "west of the Alleghenies," as acknowledgement of the institutional and psychological border of these mountains.

At the time of Kentuck Knob's construction, it was part of a 79 acre parcel that owner I.N. Hagan purchased on July 17, 1953 for \$9000.<sup>42</sup> It was located fourteen miles from his office in downtown Uniontown.<sup>43</sup> The site consisted of steep rocky soil on a plot that had been farmed and stripped of trees. The heavily wooded quality that the site now enjoys reflects the intense campaign to plant thousands of trees accompanying the house's construction. The road to Kentuck Knob turns off of Route 381 and approaches the house from the southeast. Ascending at an increasing grade, the road views the prow-like porch of the house from below

through the trees before winding around to the entrance court where the low roof and 120 degree angles of the house seem to embrace visitors.

Like so many Wright designs, Kentuck Knob is “of the hill, not on it.” The house is just below the highest point on the site. Visitors can ascend this slight rise to just above the roof and look down on it. The site is heavily wooded and has recalled for some visitors the Japanese landscapes of which Wright was very fond. At the same time, the dramatic mountain views are characteristic. Architectural historian James Van Trump wrote romantically, “By day, the view of the sky and the mountain caught in the hawk’s eye seemingly stretches to infinity.”<sup>44</sup>

### **Frank Lloyd Wright and the Hagens**

I. N. Hagan was a native of Uniontown Pennsylvania.<sup>45</sup> Known throughout his life by his initials, he was named for his grandfather, Isaac Newton Hagan, who had founded the I. N. Hagan Ice Cream Company in 1878.<sup>46</sup> The younger I.N. became president of the company, which boasted about the richness of its products and its pioneering status as the first manufacturer of ice cream west of the Allegheny Mountains. Bernadine Loomis was a schoolteacher and artist who had known Hagan since childhood. They married in 1930 and moved into a large, Queen Anne Style house in Uniontown. In 1932, they had a son, S. Paul Hagan.

The Hagens were acquainted with the Edgar Kaufmann family, clients of Fallingwater, just seven miles up the road. Their introduction came in 1940, when E.J. Kaufmann entered the Hagan Ice Cream offices in Uniontown to ask Hagan to bottle the milk from Kaufmann’s cows.<sup>47</sup> Kaufmann invited the Hagens to Fallingwater, “and that is when our ideas about architecture and lifestyle began to change,”<sup>48</sup> Bernardine Hagan recounted. They had heard about Frank :Lloyd Wright through magazine articles. Then, at Fallingwater, they found everything that they loved in the “woodland setting, the stream, the beautiful stonework, and a house that seemed to grow out of the hillside.”<sup>49</sup> The Hagens visited Fallingwater once or twice a year for the next twelve years, “falling more and more in love.”<sup>50</sup> In the mean time, their son Paul went to boarding school, then to Princeton University, where he studied art and architecture. He often brought home aspiring architects who wanted to see Fallingwater. When Paul got married in 1953, most of the men at the wedding were aspiring architects. After the ceremony, the Hagens went with Phil Cotton, one of Paul’s friends in architecture, to Fallingwater, and I.N. asked Kaufmann if he

thought that Wright would build them a house. Kaufmann's response was yes, but they should call rather than write, and they should tell the architect just half of what their real budget was. In mid-August 1953, the Hagans went with Phil Cotton to Spring Green.

They arrived at Taliesin for an audience with Wright, who was then 86 years old. The architect asked them about their lifestyle, their preference of building materials and how many rooms they needed. The Hagans replied that they lived in a rural area, but they liked to have dinner parties. They wanted stone and wood, and they needed three bedrooms and two baths on one floor. Bernardine mentioned that she was an amateur painter, but Wright rejoined, "Painting is debilitating."<sup>51</sup> He suggested that they have a copper roof rather than the Hagans' suggested hand-hewn shakes because of fire safety. Finally, Wright asked them to return in September with photographs and a topographical map.

They returned to Taliesin on September 12, 1953 with their son Paul and daughter-in-law Bonnie. They celebrated Paul's birthday at dinner, and they also listened to a long lecture by Wright's wife Olgivanna on her mentor, philosopher and mystic, Georgi Gurdjieff. They were told that plans would arrive in about a month. In November of 1953, the Hagans traveled to Taliesin West, outside of Scottsdale, Arizona to discuss the original plans with Wright. Meeting with Wright in his living room, they studied the drawings with their distinct hexagonal module that showed three bedrooms, two baths and a large living room divided by a central core for the kitchen and utilities. When they asked for more space in the living room, Wright complied by adding a module to the end of the house. They also asked for a larger dining room, which Wright provided by enclosing part of the outdoor terrace. Wright also agreed to extend storage room for a pump in the area between the house and the carport.

The Hagans made at least three more visits to Taliesin West before final plans arrived in early 1954. When Bernardine asked if they were in budget, Wright replied, "My dear lady, I have no idea." In May 1954, though, the contractor's estimate of \$124,000, slightly over twice the original \$60,000 budget, seemed to affirm E.J. Kaufmann's original cautionary advice.

Extensive correspondence and photographs document the construction of the house. Wright himself only visited the house once, in 1955, when construction was completed up to the floor level. Wright had come to the area for E.J. Kaufmann's funeral.

The Hagans moved in on July 29, 1956, their 29<sup>th</sup> wedding anniversary, at which point the house had built-in beds, but no carpet, furniture or kitchen countertops. The final cost had been \$83,329 for construction, \$12,106 for furnishings and \$1,622 for landscaping, bringing the total cost to \$96,057.

The Hagans were not a large client for Wright. They knew that the architect was choosing to have them as clients and not vice versa. But they felt very strong empathy with the architect's designs, as well as with his accompanying values regarding nature and humanity, for individualism and against statism. The house fulfilled all of their expectations and more. A year after moving in, the Hagans wrote to Wright, "We now tend to look upon our house as a great climax in our lives. To live in it is a privilege. As a work of art, it is a continuing revelation."<sup>52</sup>

### **Builders and Suppliers**

Donald Peles, alternately spelled Pelish, and his wife Anna sold the property to the Hagans and retained the right to live in a farmhouse near the road.

Herman Keys was the builder of the Hagan House. He had previously been known in the region as the builder of the State Theater on Main Street in Uniontown. Seventy-three when the house began construction, he began the process by serving as the agent in buying the property. He worked as the builder through completed construction. The Hagans described him as "a great craftsman and perfectionist."<sup>53</sup>

John H. "Jack" Howe was Wright's chief draftsman on the project, and Allen L. "Davy" Davison, an apprentice from the Pittsburgh area, helped prepare the working drawings and supervised construction of the house. Author Donald Hoffmann has attributed some clumsiness of detailing to him.<sup>54</sup>

Jesse Wilson was a master mason from Markleysburg, Pennsylvania, who worked with his son, Jesse J. Wilson building the walls of the house.

Clarence S. Coughenour, as the millwork foreman at the Charles F. Eggers Lumber Company in Uniontown, produced all of the woodwork. I.N. Hagan was also very complimentary of Coughenour's artistic skills and attention to detail.

Henry J. Cooper, a contractor from Uniontown, installed the roof. The copper came from the Revere Copper and Brass plant in Rome, New York.

A number of people participated in selecting furnishings and décor. Edgar Kaufmann jr.,<sup>55</sup> who directed the industrial design department at the Museum of Modern Art, with his friend interior designer Paul Mayen directed the Hagans to buy

chairs designed by Hans J. Wegner from the Georg Jensen showroom in New York. They also purchased a chair by Finn Juhl. Two tables and a chair came from George Nakashima in New Hope, PA. Seat cushions were made with fabric designed by Jack Lenor Larsen. Ray Woods of Uniontown was upholsterer for the bench cushions. Kaufmann's Department Store of Pittsburgh provided oriental rugs. Robert Taylor, an architect based in Pittsburgh, provided landscape design services.

### **A Note on Hexagons and Hexagonal Grids**

The hexagon and gridded variations on its form are so firmly ensconced in both our understanding of nature and our recollection of history that the shape and its many possible manipulations ought probably to seem more familiar to us than they really do. And yet, in contrast to millennia of building, Frank Lloyd Wright's work of the past several decades has brought innovations in the use of hexagonal form. Historical analysis of these forms is a broad and ongoing investigation, but an examination of a few examples can put both the continuity and the originality of Wright's work in more definite perspective.

Nature produces not simply hexagons but hexagonal grids with frequency and ease. The most obvious example of these is the honeycomb. The characteristics of group organization, communal effort, construction, cultivation and storage that are associated with bees only lend further resonance to considerations of honeycomb grids in architecture. Historian George Hersey discusses some of these associations in arguing that architecture is not so much a human impulse as a biological one.<sup>56</sup>

Hexagonal forms and their gridded counterparts are significantly present in ancient architecture as well. Vitruvius describes the design of a six-columned tholos.<sup>57</sup> At Hadrian's villa, a floor mosaic uses overlapping circles to create a hexagonal grid.

If these architectural precedents have been downplayed or effaced over time, doubtless Leonardo da Vinci is partly to blame. As one of the Western world's most iconic images, his Vitruvian man persists as an assertion that the circle and the square are the foremost motifs in defining the human body in relation to the universe and, therefore, the architecture that accompanies it. Only secondarily, then do hexagons appear in Renaissance treatises. Both Leon Battista Alberti and

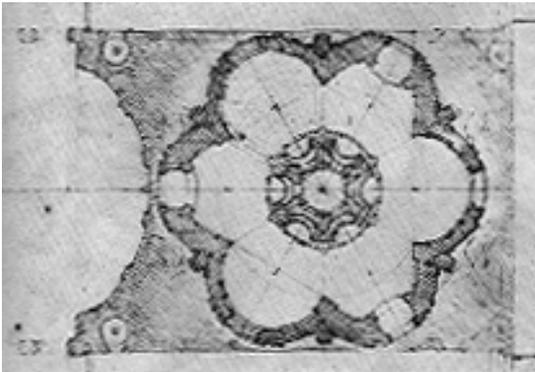
Sebastiano Serlio, as only two examples, describe the geometric derivation of the hexagon and subsequently delineate architectural plans based on that shape.<sup>58</sup>

The increased tectonic freedom of expression in the period of the Italian Baroque resulted in greater opportunities for sophisticated geometric exploration. Borromini's classic Sant'Ivo alle Sapienza has a highly modified six-pointed star as the generating form of its plan, which means that there is an implied hexagon as its center.

With the nineteenth century come designs and manipulations of this specific geometric form that have a more direct bearing on Wright's later work. The Froebel gifts that Wright played with as a child had primarily rectilinear exercises, but triangular elements were mixed in, making hexagonal geometries an important possibility.<sup>59</sup> Likewise, Wright cited Owen Jones's *Grammar of Ornament* as an important resource in his education.<sup>60</sup> Of course, Wright's most widely mentioned influence is Louis Sullivan, in whose treatises on ornament, hexagons do serve as a generating form.<sup>61</sup>

Hexagons as well as other varieties of 60 degree and 90 degree geometries exist in profusion in Wright's work, allowing for extensive analysis. Wright's Hanna House is widely cited as the first architectural implementation of a hexagonal grid in the plan of a building.<sup>62</sup> Less widely mentioned is that the idea for a hexagonal grid came from Wright apprentice Cornelia Brierly, who used the device in a Usonian design for her aunts in suburban Pittsburgh.<sup>63</sup>

Key to study of the Hagan House is its unique hybrid hexagon and star grid. It seems in some ways almost like an Islamic pattern, perhaps from the pages of Owen Jones. While Donald Hoffman describes the difficulties of dimensioning that most likely prevented its further use, geometric analysis (cf.) shows that this grid has singular properties that enhance the spatially experiential possibilities of the Hagan House. The singular grid leads to singular architectural characteristics. "I am convinced that the cross-section of the honeycomb has more fertility and flexibility where human movement is concerned than the square."<sup>64</sup> But where Wright said that the Hanna House grid was "conservatively treated," he became more adventurous in the Hagan House. And an adventurous undertaking for Wright suggests potentially limitless opportunities for exploration and interpretation.



Sant'Ivo della Sapienza (1643-8)  
Rome  
Francesco Borromini

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<sup>1</sup> quoted in Studs Terkel, *The Good War: an Oral History of World War II* (New York: Pantheon Books, 1984), p. 367.

<sup>2</sup> Ellen M. Plante, *The American Kitchen 1700 to the Present* (New York: Facts on File, 1995), p. 270.

<sup>3</sup> David R. Goldfield and Blaine A. Brownell, *Urban America: A History* (Boston: Houghton Mifflin, 1990), p. 345.

<sup>4</sup> William S. Kowinski, *The Malling of America* (New York: William Morrow, 1985).

<sup>5</sup> Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985), p. 236.

<sup>6</sup> quoted in Leland Roth, ed., *American Builds: Source Documents in American Architecture and Planning* (New York: Harper and Row, 1983), p. 537.

<sup>7</sup> Arthur Miller, *Death of a Salesman*, Harold Bloom, ed. (New York: Chelsea House Publishers, 1988), p. 71.

<sup>8</sup> Henry-Russell Hitchcock and Philip Johnson, *The International Style: Architecture Since 1922* (New York: W.W. Norton & Co., 1932). See also Richard Guy Wilson, "International Style: The MoMA Exhibition," *Progressive Architecture* 63 (February 1982), pp. 92-105.

<sup>9</sup> Philip Johnson, *Mies Van der Rohe*, 3<sup>rd</sup> edn., (New York: 1978), p. 203.

<sup>10</sup> Louis I. Kahn, "Order Is," quoted in Leland M. Roth, ed., *America Builds* (New York: Harper & Row, 1982), p. 507.

<sup>11</sup> Henry-Russell Hitchcock and Arthur Drexler, *Built in the USA: Post-War Architecture*. (New York: The Museum of Modern Art and Simon and Schuster, 1953), p. 10.

<sup>12</sup> *Ibid.*

<sup>13</sup> quoted in Michael Webb, *Modernism Reborn: Mid-century American Houses* (New York: Universe Publications, 2001), p. 26. See also Richard Guy Wilson, ed., *The Machine Age in America: 1918-1941* (New York: Brooklyn Museum of Art, 1983), p. 176.

<sup>14</sup> James Ward, *The Artifacts of Buckminster Fuller: A Comprehensive Collection of His Designs and Drawings in Four Volumes*, volume 2 (New York and London: Garland Publishing, Inc. 1985), p. 109.

<sup>15</sup> *Arts Architecture*, December 1945, p. 44. There are numerous publications on the Case Study Houses, including Elizabeth A.T. Smith, ed *Blueprints for Modern Living: History and Legacy of the Case Study Houses* (Los Angeles: Museum of Contemporary Art and Cambridge Mass.: The MIT Press, 1989); Esther McCoy, *Case Study Houses: 1945-1962*, 2<sup>nd</sup> ed. (Los Angeles: Hennessey & Ingalls, Inc., 1977); Esther McCoy, "Arts & Architecture Case Study Houses," *Perspecta* 15 (1977), pp. 55-69.

<sup>16</sup> James Steele. *Eames House: Charles and Ray Eames*, (London: Phaidon Press, 1994), p. 23.

<sup>17</sup> Paul Makovsky, "The Eames Experience," *Metropolis* XXIV:5 (January 2005), pp. 65-79+.

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<sup>18</sup> Alice T. Friedman, *Women and the Making of the Modern House: A Social and Architectural History* (New York: Abrams, 1998), passim.

<sup>19</sup> Dirk Lohan, "Mies van der Rohe: The Farnsworth House," *Global Architecture Detail* (Tokyo: A.D.A. Edita, 1976).

<sup>20</sup> John Howey, *The Sarasota School of Architecture: 1941-1966* (Cambridge, Mass.: The MIT Press, 1995).

<sup>21</sup> Neil Levine, *Frank Lloyd Wright* (New York: Princeton University Press, 1996), p. vii cites numerous polls among architects that list Wright as their favorite by broad margins.

<sup>22</sup> Vincent Scully, *Frank Lloyd Wright* (New York: George Braziller, 1960), p. 11.

<sup>23</sup> "Meet Mr. Frank Lloyd Wright: A Conversation with Hugh Downs," broadcast May 17, 1953, reprinted in Patrick J. Meehan, ed. *The Master Architect: Conversations with Frank Lloyd Wright* (New York: Wiley Interscience, 1984), p. 49 and quoted in William Cronon, "In constant Unity: The Passion of Frank Lloyd Wright," in Terence Riley, ed., *Frank Lloyd Wright, Architect* (New York: The Museum of Modern Art, 1994), 15.

<sup>24</sup> Hagan, 14. This same quote appears in Besinger and elsewhere.

<sup>25</sup> Frank Lloyd Wright, *An Autobiography* (London: Quadrant Books, 1932, 1943, 1977), p. 38.

<sup>26</sup> Originally published in Louis Sullivan, "The tall office building artistically considered," *Lippincott's Magazine*, March 1896. On Sullivan see also Frank Lloyd Wright, *Genius and the Mobocracy* (New York: Duell, Sloan and Pearce, 1949); Robert Twombly, *Louis Sullivan: His Life and Work* (New York: Viking, 1986) and Louis Sullivan, *Autobiography of an Idea* (New York: Peter Smith, 1924, 1949).

<sup>27</sup> Davis Van Zanten, *Sullivan's City: The Meaning of Ornament to Louis Sullivan* (New York: W.W. Norton & Company, 2000).

<sup>28</sup> Frank Lloyd Wright, *Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright* (Berlin: Ernst Wasmuth, 1908) quoted in Bruce Brooks Pfeiffer, ed., *Frank Lloyd Wright: Collected Writings: Volume I, 1894-1930* (New York: Rizzoli International Publications in Association with the Frank Lloyd Wright Foundation, 1992), p. 114.

<sup>29</sup> See for example Frank Lloyd Wright, "A Home in a Prairie Town," *Ladies Home Journal* (February 1901), p. 17; Frank Lloyd Wright, "A Small House with 'Lots of Room in it,'" *Ladies Home Journal* (July 1901), p. 15.

<sup>30</sup> Anthony Alofsin, *Frank Lloyd Wright: The Lost Years, 1910-1922* (Chicago and London: The University of Chicago Press, 1993), pp. 9-12.

<sup>31</sup> H. Allen Brooks, *The Prairie School: Frank Lloyd Wright and His Midwest Contemporaries* (New York: W.W. Norton, 1976), 56. See also Grant Carpenter Manson, *Frank Lloyd Wright: The First Golden Age* (New York: Reinhold Publishing Corp., 1958).

<sup>32</sup> Frank Lloyd Wright, "In the Cause of Architecture: In the Wake of the Quake, Concerning the Imperial Hotel, Tokio," *Western Architect* 32 (November 1923), 129.

<sup>33</sup> See Alofsin.

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<sup>34</sup> Robert Twombly, *Frank Lloyd Wright: His Life and His Architecture* (New York: John Wiley & Sons, 1979), p. 212.

<sup>35</sup> *Architectural Forum*, (January 1938) devoted the magazine's entire issue to Wright's recent work.

<sup>36</sup> Edgar Kaufmann, jr. *Fallingwater: A Frank Lloyd Wright Country House* (New York: Abbeville Press, 1986), p. 28.

<sup>37</sup> Frank Lloyd Wright, "Usonian House for Herbert Jacobs," *Architectural Forum* (January 1938), p. 78. See also Alvin Rosenbaum, *Usonia: Frank Lloyd Wright's Design for America* (Washington, D.C.: preservation Press, 1993) and Roland Reisley, *Usonia, New York: Building a Community with Frank Lloyd Wright* (New York: Princeton Architectural Press, 2001).

<sup>38</sup> See Bruce Brooks Pfeiffer, ed., *Frank Lloyd Wright: The Crowning Decade, 1949-1959* (Fresno, California: Press at California State University, Fresno).

<sup>39</sup> Twombly, *Frank Lloyd Wright*, p. 409.

<sup>40</sup> Because of the proximity of Kentuck Knob to Fallingwater, one of the more thorough natural and cultural histories of the region is Franklin Toker, *Fallingwater Rising*, (New York: Alfred a. Knopf, 2003), pp. 77-101.

<sup>41</sup> For the specific history of the site, see Donald Hoffman, *Frank Lloyd Wright's House on Kentuck Knob*, (Pittsburgh: University of Pittsburgh Press, 2003).

<sup>42</sup> Bernardine Hagan, *Kentuck Knob: Frank Lloyd Wright's House for I.N. and Bernardine Hagan*, (Pittsburgh: The Local History Company, 2005) contains the most detailed history of the property transactions, design interactions and construction phasing that led to the completed house.

<sup>43</sup> "The I.N. Hagan House at Kentuck Knob." *The Frank Lloyd Wright Quarterly*, XV:4 (Fall 2004), pp. 14-23.

<sup>44</sup> James Van Trump, "Caught in the Hawk's Eye: The House of I.N. Hagan at Kentuck Knob," *Charette* (April 1964), n.p.

<sup>45</sup> This section is based directly on notes by Kai Gutschow.

<sup>46</sup> The most extensive published listing of contractors workers and suppliers on the Hagan House is found in Hagan, *Kentuck Knob*. Among other sources, Donald Hoffman's monograph and the recent *Frank Lloyd Wright Quarterly* article, op. cit., are also informative.

<sup>47</sup> Hagan, p. 4.

<sup>48</sup> Ibid.

<sup>49</sup> Ibid.

<sup>50</sup> Ibid.

<sup>51</sup> Ibid., p. 8.

<sup>52</sup> Hoffman.

<sup>53</sup> Hoffman, p. 39.

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<sup>54</sup> For accounts of the Taliesin Fellowship, see Curtis Besinger, *Working with Mr. Wright: What It Was Like* (Cambridge [England] and New York: Cambridge University Press, 1997) and Myron and Shirley Marty, *Frank Lloyd Wright's Taliesin Fellowship* (Kirksville, Missouri: Truman State University Press, 1997).

<sup>55</sup> The most detailed biography of Edgar Kaufmann, jr is found in Toker, *Fallingwater Rising*.

<sup>56</sup> George Hersey, *The Monumental Impulse: Architecture's Biological Roots* (Cambridge, Massachusetts: M.I.T. Press, 1999).

<sup>57</sup> Marcus Vitruvius Pollio, *Vitruvius on Architecture*, Thomas Gordon Smith, ed. (New York: Monacelli Press, 2003).

<sup>58</sup> Leon Battista Alberti, *On the Art of Building in Ten Books*, Robert Tavernor, et. al., transl., (Cambridge, Mass.: M.I.T. press, 1988); and Sebastiano Serlio, *Sebastiano Serlio on Architecture: : Books I-V of Tutte l'opere d'architettura et prospetiva*, Vaughan Hart and Peter Brooks, ed. (New Haven: Yale University Press, 1996).

<sup>59</sup> See Manson, op. cit.

<sup>60</sup> Owen Jones, *The Grammar of Ornament* (London: Quaritch, 1910, 1928).

<sup>61</sup> Louis Sullivan, *The Function of Ornament*, Wim de Wit, ed (New York: Chicago Historical Society and Saint Louis Art Museum in association with W.W. Norton, 1986); Louis H. Sullivan, *A System of Architectural Ornament* (New York: Rizzoli International, 1990) and Van Zanten, op. cit.

<sup>62</sup> Paul R. and Jean S. Hanna, *Frank Lloyd Wright's Hanna House: the Client's Report* (Carbondale: Southern Illinois University Press, 1981, 1987).

<sup>63</sup> Richard Joncas, "Pedagogy and 'Reflex': Frank Lloyd Wright's Hanna House Revisited," *JSAH* 52: 3 (September 1993), pp. 307-322 and Donald Miller and Aaron Sheon, *Organic Vision: The Architecture of Peter Berndtson* (Pittsburgh: Hexagon Press, 1980).

<sup>64</sup> Frank Lloyd Wright, "'Honeycomb,' Paul Hanna House," *Architectural Forum* (January 1938), p. 68.

PROJECT:  
**Architectural Restoration and Conservation (ARC) of Carved-Wood Interiors  
2004-2005**

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- \* Hoffmann, Donald. FLW's Kentuck Knob (2000)
- Storrer, William. The FLW Companion (1993), p.405.
- Pfeiffer, B.B & Y. Futagawa. FLW Selected Houses vol.7 (1991), pp.162-175
- Pfeiffer, B.B. & Y. Futagawa, FLW Monograph, 1951-1959 vol.8 (1988), pp.124-125

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- National Register Nomination form, prepared by Clinton Piper, 2000:  
<<http://www.cr.nps.gov/nhl/designations/samples/pa/hagan.pdf>>
- HABS Photos on-line at Library of Congress:  
<[http://www.loc.gov/rr/print/list/103\\_flw.html#pa](http://www.loc.gov/rr/print/list/103_flw.html#pa)>
- Restoration "As-Built" Plans, 1988, in Hunt Library Architectural Archives, CMU
- Slides of Hagan House Construction Process, by I.N. Hagan, in Hunt Library Architectural Archives, CMU
- Hagan House Working Drawings, set from Taliesin Archives (6 sheets)
- Kentuck Knob website: <<http://www.kentuckknob.com>>

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- "The I.N. Hagan House-Kentuck Knob," FLW Quarterly 15:4 (Fall 2004): 14-23.
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----- What is Modern Interior Design? (MoMA 1953)  
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## APPENDIX II: KENTUCK KNOB CHRONOLOGY

- 1878 Founding of Hagan Ice Cream
- 1930 Marriage of I.N. and Bernadine Hagan.
- 1936-38 Fallingwater built
- 1939 Kaufmann office
- 1940 Kaufmann to Hagan Ice Cream
- 1940-53 Hagens visit Fallingwater 1-2 times per summer. Live at 240 Derrick Ave., Uniontown.
- 1947-49 FLW designs Point projects for Pgh.
- 1951 Hagens visit "Sixty Years of Living Architecture and model Usonian House on future Guggenheim site in NYC
- 1952-53 FLW designs Point View Apartments, Pgh.
- June 1953 House Beautiful issue with Lewis Mumford article inspires Hagens.
- July 1953 Purchase property, 80 acres, from Pelish family, \$9,000
- Aug. 9, 1953 Hagens visit Fallingwater, compose letter to FLW.
- Aug. 11, 1953 Paul Hagan Wedding.
- Aug. 24, 1953 Hagens 1<sup>st</sup> trip to Taliesin. Visit Johnson Wax, Jacobs House, Richard Smith House, Unitarian Meeting House.
- Sept. 12, 1953 Hagens 2<sup>nd</sup> trip to Taliesin.
- Sept. 28, 1953 Hagan sends FLW photos
- Fall 1953 Hagens to NYC, Guggenheim
- Nov. 1953 Hagens to T-West to discuss plans
- Dec. 1953 Correspondence. Consider flat roof, and horizontal board-and-batten walls
- Feb. 13, 1954 Hagens receive first plans (dated Feb. 1, 1953).
- Mar. 1954 Revised plans
- April 1954 Working drawings arrive
- April 13, 1954 Sketches for Uniontown Ice Cream Company arrive. Later abandoned.
- April-May 1954 Siting of House. Hagens begin planting 8,800 seedlings on north slope
- May 1954 Estimate of \$124,000 (vs. original \$60,000)
- Summer-Fall 1954 Footers and foundations poured to parapet height by end of Fall
- Mar 1955 Construction resumes, stone veneer laid. Davey Davison shows Wilson how to lay stone "naturally"
- May 1955 FLW visits when house "at datum." FLW in town for Kaufmann funeral [sic] Kaufmann dies April 1955. May 11 Hagan writes he's looking

forward to FLW's visit soon. .

Fall 1955 Walls and framing done, roof covered in plywood.

Sept. 1955 Flagstone substituted for concrete floors, approval by Taliesin.

Nov. 1955 Special FLW issue of House Beautiful with Heritage furniture. Ad for Jensen. Kaufmann in Art in America on Nakashima.

Winter 1956 Contact Taliesin for furniture and carpets.  
Ordered first piece of Nakashima furniture [sic!].

June 1956 Hagens to NYC with E.J. Kaufmann Jr. With designer Paul Mayen.  
Order several Wegner chairs and several pieces by Juhl. Fabric for couch from Lars Larson. 3 brass lamps from Hansen.  
On way home stopped by George Nakashima studio in New Hope, PA.  
Order DR chairs, stools, and entry chest. Order arrives Oct. 1956

July 29, 1956 Hagens move in, 26<sup>th</sup> wedding anniversary, kitchen not finished

Summer 1956 Robert Taylor of CMU helps design rear fountain and rock garden.

Dec. 1958 Hagens request wood screen from Eugene Masselink

Sept. 1959 Jack Howe installs red FLW signature tile

1969 Hagens visit Nakashima, order replacement DR table, installed Oct. 1970

Aug. 1971 Olgivanna Wright & fellowship visit. Frequently members of fellowship would stop by. Many visitors: Nakashima and family. Bob Taylor & family, and CMU students. Henry Koerner. Arthur Ziegler & James van Trump. Raeburn, Bill Storrer, Allen Brooks.

1973 Hagens purchase Fallingwater greenhouse.

Mar. 1985 Jack Boucher of Library of Congress photographs house

Aug. 8, 1985 Palumbo visits Fallingwater and Hagan House

Feb. 1986 House sold to Palumbo. Hagens move to Spruce Way, Uniontown.

May 26, 1986 Bedroom wing burns.

1992 Death of I.N. Hagan

1996 Palumbo makes house available to public.

2000 Kentuck Knob designated a National Historic Landmark

Dec. 2004 Kentuck Knob cover story for Frank Lloyd Wright Quarterly

April 2005 Bernadine Hagan's book FLW's House for I.N. and Bernadine Hagan published by The Local History Company, Pittsburgh

### APPENDIX III: FRANK LLOYD WRIGHT CHRONOLOGY, 1932-59

- 1932 FLW **Autobiography** published, 1st ed. (also 1943, 1977)  
FLW **The Disappearing City** published (decentralization advocated)  
May-Oct. "**Modern Architecture**" exhibit at MoMA, NY (H.R. Hitchcock & P. Johnson, Int'l Style)  
Malcolm Wiley Hse., Proj. #1, Minneapolis, MN (revised and built 1934)  
Oct. **Taliesin Fellowship** formed, 32 apprentices, additions to Taliesin Bldgs.
- 1933 Jan. Hitler comes to power in Germany, diaspora to America: Gropius (Harvard, 1937), Mies v.d. Rohe (IIT, 1939), Mendelsohn (Berkeley, 1941), A. Aalto (MIT, 1942)  
Mar. F.D. Roosevelt inaugurated, New Deal (1933-40) "One hundred days." 25% unemployment.  
A.A.A., C.C.C. P.W.A., N.R.A., T.V.A., F.D.I.C. started, abandon gold standard  
\*Hillside Theater, Curtain, outbuildings, Taliesin, Spring Green, WI  
\*Malcom Willey Hse., Minneapolis, MN (1933-34)
- 1934 \***Broadacre City** Masterplan (proj.), model begun  
First issue of Taliesin magazine  
Dec. FLW visits **Pittsburgh**, Bear Run site  
First year of annual move to Arizona with entire fellowship, Chandler, AZ.  
Broadacre model made
- 1935 \*Edgar J. Kaufmann Hse., (= **Fallingwater**), Mill Run, PA (1935-7)  
\*Lusk Hse., Huron, SD (proj.)  
\*Hoult Hse., Wichita, KS (proj., first Usonian)  
Apr. Broadacre City tours USA: New York, Pittsburgh, Washington DC, WI, MI  
Apr.-June. "Second 100 Days." W.P.A. (1935-43); R.A.; Social Security; Rural electrification
- 1936 Jan. Fellowship at Chandler  
\*Herbert **Jacobs** Hse., (Usonian) Madison, WI  
\*Paul & Jean **Hanna** Hse., Stanford, CA (= "Honeycomb", additions 1946, 1956)  
\***Johnson Wax Admin.** Bldg., Racine, WI (1936-9; 1944-50)  
China-Japan War; Spanish Civil War; Rome-Berlin Axis formed

- 1937 FLW sick with pneumonia, no trip to AZ in Winter 1936-7  
 \*Herbert F. Johnson Hse., (= **Wingspread**) Wind Point, WI (vic. Racine)  
 \*Kaufmann Dept. Store Office, Pittsburgh, PA  
 June. FLW travels to Russia to attend World Conference of Architects  
 Dec. Buys 800 acres of government land in Paradise Valley, AZ,  
 becomes **Taliesin West**
- 1938 Ministry of Education, L. Costa & O. Niemeyer, Rio de Janeiro, Brazil  
 Jan. FLW in Time, Architectural Forum  
 \***T-West** begun with construction of "SunTrap", Scottsdale, AZ (1938-present)  
 \*Ardmore Suntop Homes, Ardmore, PA  
 \*Florida Southern College Master Plan (& Pfeiffer Chapel), Lakeland, FL (1938-58)  
 \*Fallingwater Guest Hse., Mill Run, PA  
 \*Monona Terrace Civic Center, Madison, WI (proj., also 1954, constructed 1994)  
 \*Midway Barns, Taliesin, Spring Green, WI  
 \*Ben Rebhuhn Hse., Great Neck, NY  
 \*Ralph **Jester Hse.**, Palos Verdes, CA (proj., plywood, circles)  
 \*Usonia II Cooperative Settlement, Okemos, MI (proj. vic. Lansing)  
 Sept. "House for \$5000" Life Magazine  
 Villa Mairea, A. Aalto, Noormarkku, Finland, (1938-41)
- 1939 \*Loren **Pope-Leighy Hse.**, Falls Church, VA (1939-40, moved to Mt. Vernon 1964)  
 \*Leigh Stevens Hse. & Estate (= Aldbrass) Yemassee, SC  
 \*Stanley **Rosenbaum Hse.**, Florence, AL (additions 1946)  
 \*Bernard Schwartz Hse., Two Rivers, WI (copy of Life Hse., Sept. 1938)  
 \*Goetsch-Winkler Hse., Okemos, MI (also 1949 proj.)  
 \*George **Sturges Hse.**, Brentwood, CA (additions 1942)  
 Invited to lecture in London, later published as An Organic Architecture Gone with the Wind, Wizard of Oz, Grapes of Wrath published
- 1939-45 **World War II in Europe** (US joins 1941)
- 1940 FLW solo exhibit at MoMA, New York (includes model Usonian Hse.)  
 FLW Foundation established, tax-free educational organization  
 \*John C. Pew Hse., Madison, WI  
 \*Theodore Baird Hse., Amherst, MA  
 \*Gregor Afflek Hse., Bloomfield Hills, MI (1940-1)

- 1941 \*Arch Oboler Hse., (= Eaglefeather) Malibu, CA (proj.)  
 Anthology FLW: On Architecture ed. F. Gutheim, published  
 S. Giedion's Space, Time and Architecture
- 1942 \*Quadruple Housing (= Cloverleaf, for F.H.A.)  
 H.R. Hitchcock, In the Nature of Materials (first English FLW book)
- 1943 \*Solomon **Guggenheim Museum**, New York (1943-59, constr. 1956ff)  
 \*Herbert **Jacobs Hse. II**, (= Solar Hemicycle) Middletown, WI (1943-8)  
 Revised edition of Autobiography (first 1932; 3<sup>rd</sup> ed. 1977)  
 Ayn Rand, The Fountainhead published (movie with Gary Cooper, 1949)
- 1944 \***Johnson Wax Research Tower**, Racine, WI  
 "Glass House," Ladies Home Journal  
 \*Midway Farmhouse, Taliesin, Spring Green, WI
- 1945 \*V.C. Morris Hse. (= Seacliff), San Francisco, CA (proj.)  
 Aug. end of World War II  
 FLW, When Democracy Builds published (revision of "Disappearing City")
- 1946 \*Calico Mills Dept. Store, Ahmedabad, India (proj. for Sarabhi)  
 \*Ayn Rand Hse., (proj. Hollywood, or Redding, CT)  
 \*Roger Lacy Hotel, Dallas, TX (proj.)  
 Edgar J. Kaufmann Desert Hse. by Richard Neutra, Palm Springs, CA
- 1947 \***Point Park Community Ctr.**, Pittsburgh, PA (proj., scheme #2 1948)  
 \***Unitarian Church**, Madison, WI  
 \*Usonia II Housing, Pleasantville, NY (incl. Sol Friedman Hse., 1948)
- 1948 Jan. FLW issue Architectural Forum  
 \***Morris Gift Shop**, San Francisco, CA  
 \*Sol Friedman Hse., Pleasantville, NY  
 Equitable Bldg., by P. Belluschi, Portland, OR; GM Technical Center, by  
 E. Saarinen, Warren, MI
- 1949 Feb. 26. FLW meets with Pres. Truman about Taliesin power lines; APS  
 lines installed at T-West  
 \*Usonian Automatic Hse. (proj., concrete blocks)  
 \*San Francisco Bay Bridge (proj.)  
 Awarded AIA Gold Medal  
 FLW, Genius & Mobocracy published (on Louis Sullivan)  
 Glass House, by P. Johnson, New Canaan, CT
- 1950 \*David Wright Hse., Phoenix, AZ  
 \*Zimmerman Hse., Manchester, NH  
 Chapel of Notre-Dame-du-Haut, by Le Corbusier, Ronchamp, France

- (1950-4)  
 Bavinger Hse., by Bruce Goff, Norman, OK  
 UN Building in New York completed
- 1950-3 Korean War
- 1951 Jan. FLW issue Architectural Forum  
 \*E.J. & Lilianne Kaufmann Hse. (= Boulder Hse.), Palm Springs, CA  
 (proj.)  
 \*Cabaret Theater added, dining room glassed in at T-West, Scottsdale, AZ  
 FLW Exhibit "60 Years of Living Architecture", Gimbel's Dept. Store,  
 Philadelphia. Travels to Florence, Zurich, Munich, Rotterdam, NYC,  
 LA, Mexico (1951-3)
- 1952 Lever Hse. Office Building, S.O.M., New York, 1951-2  
 \*Harold **Price Tower**, Bartlesville, OK (1952-6)  
 \*Point View Apt. Tower, Pittsburgh, PA (1952, 1953)  
 \*Hillside Playhouse burns, rebuilt, Spring Green, WI  
 Aaron Green Arch'l Office opened, San Francisco, CA
- 1953 \*Riverview Terrace Restaurant, (= Visitor Center), Taliesin, Spring Green  
 \*Masieri Student Library & Residence, Venice, Italy (proj.)  
 \***Point View Residences**, Pgh., PA (proj.)  
 FLW, The Future of Architecture published  
 Hugh Downs interviews FLW on TV (cf Mike Wallace interviews, 1957)
- 1954 \***Beth Sholom Synagogue**, Elkins Park, PA  
 \***Hagan Hse.**, (= Kentuck Knob) Uniontown, PA  
 \*FLW Apt. in Plaza Hotel, New York City  
 \*Harold Price Hse., Phoenix, AZ  
 FLW, The Natural House published
- 1955 \*Kundert Medical Clinic, San Luis Obispo, CA  
 \*Pappas Hse. St. Louis, MO (Usonian automatic)  
 \*Kalita Humphreys Theater, Dallas, TX  
 \*Lenkurt Electric Co, San Mateo, CA (proj.)  
 E.J. Kaufmann Jr., ed. An American Architecture: FLW published
- 1956 \***Annunciation Greek Orthodox Church**, Wauwatosa, WI  
 \*Erdmann Prefab, Madison WI (for Marshall Erdmann, contractor)  
 (1956-7)  
 \*Golden Beacon Apt. Tower, Chicago (proj., for Charles Glore)  
 \***Mile High Office Tower** (= The Illinois), Chicago  
 \*Gatehouse for Fallingwater, Mill Run, PA (proj., for E. Kaufmann Jr.)

\***Marin County Civic Center**, San Rafael, CA (with A. Green) (1956-66)  
 \*Guggenheim construction begins (design 1943-59)  
 TWA Terminal, E. Saarinen, Kennedy Airport, New York (1956-62)  
 Sydney Opera Hse., J. Utzon, Australia  
 1957 \*Gate Lodge for Fallingwater, Bear Run, PA (proj.)  
 \*Music Pavilion & Theater, Taliesin West, Scottsdale, AZ  
 \*Arizona State Capital, Phoenix (proj.)  
 \*Baghdad Opera, Cultural Center, University, etc. Bagdad, Iraq (proj.)  
 FLW, A Testament published  
 Sputnik satellite launched by Soviets  
 Richards Medical Center, L. Kahn, U.Penn, Philadelphia (1957-65)  
 1958 \*Seth Peterson Cottage, Lake Delton, WI  
 T-West redwood beams replaced by steel; Fiberglass roofing installed  
 FLW, The Living City published (revision of "When Democracy Builds")  
 Grant C. Manson, FLW to 1910: The Golden Years published  
 Seagram Bldg., Mies van der Rohe, New York finished  
 1959 \*Grady Gammage Auditorium, ASU, Phoenix, AZ (+ ASU Music Center)  
 Begins The Wonderful World of Architecture, a children's history of  
 architecture  
 Apr. 9. **Death of FLW**  
 Formation of Taliesin Architects, Wes Peters Chief Architect  
 Oct. Opening of Guggenheim

## APPENDIX IV: OUTLINE OF ORIGINAL PROJECT

PROJECT: **Architectural Restoration and Conservation (ARC) of Carved-Wood Interiors 2004-2005**

**Stage 1 : Re-Presentation** (01 Feb 05 – 15 April 05 )

*written report with photographs + sketches*

[This section to use identical table of contents for all participant teams]

- A. Selecting the Case, Justifying the Focus, Proposing a Research Hypothesis
  - 1. define selection procedure for each case
  - 2. outline each participant's research focus (Restoration, Duplication, Manipulation) and how the case fits
  - 3. propose a research hypothesis
  
- B. General Context of Life and Building During the Period
  - 1. socio-cultural, economic and political conditions of the building period
  - 2. position of the house within the wider regional, landscape and physical context  
[topography, landscape, parcel pattern, development and environment of the city / site, surroundings, neighborhood, etc.]
  - 3. typologies and comparable cases from the period just before and after the original construction
  - 4. personal info. on the client, architect and all known related parties (builder, suppliers, etc.)  
[motivations for building / family conditions / phase of life]
  - 5. architectural, artistic, and intellectual development of the architect/designer  
[theoretical foundations, stylistic orientation, influences, related artistic groups/models]
  - 6. the state of architecture at the moment of building  
[dominant theories of architecture, textbooks/treatises, primary influences on the profession, available technologies, stylistic trends, etc.]
  
- C. History of the House
  - 1. the design process and specific design influences  
[intellectual, formal, ideological, cultural, technological reasons the house

looks as it does]

2. building history  
[building phases, chronology of alterations, building interventions & decay, former restorations]
3. chronology of users and/or owners and their possible impact on the house

#### D. Architectural Characteristics of the House

1. site conditions : orientation, parcelling, street characteristics
2. materials use : choice and impact of stone, brick, wood, render and plaster, paint
3. architectural 'venustas'
  - a. stylistic analysis, details and ornaments ,
  - b. relation of inside to outside, entry, courtyard and garden, garden pavilions, patios, garages
  - c. decoration of walls, fire mantel pieces
  - d. woodwork : floors, ceilings, doors, built-in casework
4. architectural 'utilitas'
  - a. functional organization of rooms (kitchen, living, library, collection...)
  - b. comfort systems : water supplies, lighting, ventilation, heating, cooking
  - c. circulation : vertical and horizontal : staircases, corridors, zones of movement and rest
5. architectural 'firmitas'
  - a. construction materials and techniques
  - b. vertical elements: foundations / load-bearing walls / partitioning walls / windows
  - c. horizontal elements: floor structures & roof structure

#### E. Room-by-Room Description of House Interior including Original Furniture

1. special attention to wood carving applications
2. references to and influences from stylistic elements, precedents, other arts, or other regions

#### F. Conclusions on possible 'typology' of specific architectural elements

**Stage 2 : Documentation and Analysis ( 16 April 05 – 20 June 05 )**

*digitized drawings + poster format*

[This section should be tailored to fit the specific research focus (Restoration, Duplication, Transformation) of each participant team, though every effort should be made to keep the reserach process and results similar in content and scope]

**A. Documentation**

1. architectural plans (all floors, sections, facades )
2. catalogue of wood details (inventory and measured drawings)
  - a. Immovable elements :
    1. full wooden separation walls (construction + decoration)
    2. decorative wall-paneling + ornamentation
    3. wooden ceilings with mother and secondary beams (construction + decoration)
    4. wooden staircases : spiral and other ones + balusters
    5. wooden doors and door frames (inside / outside / porch gate doors), hatches
    6. windows with shutters and the iron hinges
    7. wooden finishing : window tablets, fire place mantels
  - b. Movable elements (furniture and cabinets)  
[Limit to those which are part of the initial concept]

**B. Analysis**

1. formal organizations, compositional principles and stylistic features
  - a. on the scale of the building
  - b. on the scale of the wood-work and details
2. spatial typologies and experiences
  - a. on the scale of the building
  - b. how the woodwork relates to or reinforces spatial sensibilities
3. symbolic systems and other experiences
  - a. on the scale of the building
  - b. how woodwork reinforces these experiences
4. Synthesis, language, typology and design process
  - a. propose ways of understanding the design of the building and woodwork as a part of a language of forms

- b. compare the building and woodwork to similar examples to propose a typology of forms
- c. speculate on the design process, moving from the central idea and first move, to the secondary elements and details

**Stage 3 : Production** (21 June 05 – 15 October 05 )

*to be discussed*

[This section must be tailored to fit the specific potential of each research focus for further implementation and production]

- Restoration and Conservation of Existing Wood Elements (Antwerp)  
[based on Traditional Methods, using New Techniques]
- Duplication of Existing Elements (NCSU)  
[using Automated (Rapid Prototyping) Systems]
- Transformation of existing patterns and Creation of New Carved-wood Elements and Systems (CMU)

## APPENDIX V: RESEARCH NOTES, STAGE I

### D. Architectural Characteristics of the House

#### D1. site conditions : orientation, parcelling, street characteristics

Site Notes:

“Organic buildings are always of the land and for the life of the building.” – FLW  
1872 map identifies area as “Little Kentuck.” (Hagan 113)

7 miles by road from Fallingwater; 4 miles by air. Fates very much connected.  
2080ft above sea level.

Eastern ridge of Chestnut Ridge in Fayette County, overlooking horseshow bend  
in Youiogheny River.

Original site plan had North arrow wrong direction, and wrong elevation. Haste.

FLW built over 30 usonians on hill sites. Most are oriented against the topo lines.  
Yet 30 degrees to N-S solar path. Thus the idea that they were “integrated” into  
nature is false.

Purchased the Pelish farm, 80 acres in July 1953, for \$9000. Pelis lived in  
farmhouse until death. Neighboring farm close, until Palumbo buys it.

Bernadine claims there was not a tree on the site. But this was onmly the north  
slope of cornfields.

FLW’s suggestion of site was to choose a place no one wanted. Bernadine chose  
the high site, FLW identified them as “perchers” (not “nesters”).

Some wondered why FLW did not place house on North of hill, with spectacular  
open view across cornfields. FLW wrote “You can’t live with grandeur all your life”  
(Hagan 111). The South face was the “domestic view,” and good in winter. Road was  
begun according to Taliesin site plan, though no one had visited the site. Allen  
(Davey) Davison, from Pittsburgh, was first apprentice to come. He moved house 10ft  
to west from original location. (Davison had been apprentice for Reisley house in  
Pleasantville, similar site?)

At first they hoped to haul stone from Fallingwater, but this proved too expensive.  
Then they found large boulders on another Hagan property. When FLW heard this,  
he penciled in a number of large boulders at the base of the house, sayiing “just push  
them up against the foundation” (Hagan 18). Contractors thought this was crazy, but  
made a game of hauling large boulders.

Hagans purchased 8,800 seedlings for north side of slope along driveway in early  
1954.

I.N. had always wanted to move to the woods; Bernadine was “never too

enthusiaistic" (Hagan, 5).

House is "of" the site. Local stone. And materials must be allowed to be themselves. House also "of" the client

House faces due south for winter sun.

Bob Taylor, of CMU, helped create the triangular rock garden at rear terrace.

Bernadine Hagan had taken several landscape design courses.

Chokecherries were the only trees at the hilltop when they bought the property.

Plants were difficult to grow in planters.

1973 they purchased the Fallingwater greenhouse, as WPC was to tear it down after Edgar Junior bequeathed it.

Carpenter Bees.

"South is the comforter of life, south side of the house is the 'living' side. Ordinarily the house should be set 30-60 to the south, well back from site, so every room has light. Sun is great luminary of life." (Natural House, Hoffmann 28-29).

House reoriented several times in early 1954. At first 30 degrees to south, then later closer to true south, LR to west.

Lamp at entry announces Japanese spirit. Quiet poetry of the horizontal (Hoffmann 52).

FLW had written of Taliesin: "Hill and house, should live together, each the happier for the other." (Hoffmann 54).

In general FLW did very little study of sites, and little site planning (Aguar). Primary factor seemed to be solar gain (not topography!).

54 angles, "like a jigsaw puzzle" to lay it out.

## **D2. Materials use : choice and impact of stone, brick, wood, render and plaster, paint**

### **D3. Architectural 'venustas'**

#### **D3a. Stylistic analysis, details and ornaments**

#### **D3b. Relation of inside to outside, entry, courtyard and garden, garden pavilions, patios, garages**

#### **D3c. Decoration of walls, fire mantel pieces**

### **D3d. Woodwork : floors, ceilings, doors, built-in casework**

#### Woodwork Notes:

Hagans suggested hand-hewn shakes for roof, but FLW insisted on copper for fire safety. In Dec. 1953, Hagans were considering wood board-and-batten (Hoffmann 21)

FLW loved cypress, still known in the lumber trade for the vast amounts he used. FLW called it the “wood eternal” But he loved the swamp cypress ven more, calling it “more eternal” (Tafel, in Hoffmann 40). Also called “bald cypress” because wood sheds hemlock-like leaves in fall. Resists rotting.

FLW often believed that wood healed itself (no finish necessary). Also believed in change and decay, “another form of growth” (Hoffmann, 42).

Coughenour of Eggers assembled “almost a car-load of clear, all-heart tidewater red cypress” and sent it by rail to Uniontown. FLW called Coughenour “a real artist.”

All wood was to be red (tidewater) cypress. Original blueprints listed Mahagoney, but specs listed cypress. All interior cabinets built at Eggers Mill, Uniontown, and installed by Oliver Frankenhouser, only master carpenter on the job. Oliver also put all cypress paneling in place. Mr. Coughenour of Eggers made silverware drawer to fit flatware (Hagan 52).

All woodwork finished with Satinlac, made by Brenner Brothers, NJ. Keys called it “woman’s varnish” since it was so easy to apply (Hagan 54). Wright said exterior to be finished by “nothing but weather.” (Hagan 201-2). But Llewellyn Wright in Bethesda told the hagans that cypress turned black and cracked if not finished. Hagans found another finish, by Brenner Brothers. Woodwork stayed same inside and outside.

First pattern for clerestory windows was considered too complicated to cut by the mill. A 2<sup>nd</sup> was also unsuitable-it made Bernadine feel as if impaled on a sword. A 3<sup>rd</sup> pattern designed by FLW himself. Patterns taken from several elements in house plan. Bernadine asked to makewood permanently installed, and windows open in, allowing for easier cleaning and cross ventilation. FLW approved, though windows different than most others.

Hagans like the cutouts on the Price House tables, suitable for window cutouts (Hagan 200).

Liked “treatment of walls and ceiling” in unnamed house in article in June 1953 House Beautiful

Wood clerestory in part based on plan. Each 1 unit long. Every other unit reversed. Patterns rise and fall like mountain range. Stone wall appears to dissolve under roof/soffit.

"We may use wood with intelligence only if we understand wood." Frank Lloyd Wright

Cypress also at Rosenbaum and Auldbrass and Kaufmann Office (1938).

Board-and-batten ceiling: drawings called for screws in battens only to hold the boards, but counter-sunk finish nails used at Kentuck.

The renovation after 1988 used wrong colored wood putty (lighter). Easy to identify.

Wood clerestory similar to Japanese "Ramma" (Hoffmann 95n45)

Working drawings show partition walls 2-1/2", but built almost twice as thick!

Wood ceiling became standard feature in California houses, after returning from Japan (Hoffmann 96)

Davey Davison picked hardware from Fort Pitt Hardware in Pgh.

#### **D4. Architectural 'utilitas'**

##### **D4a. Functional organization of rooms (kitchen, living, library, collection, bedroom...)**

Plan Notes:

Two changes not approved by FLW. The 21" wide hallway from DR to hallway seemed useless, but FLW insisted "the center core, the heart of the house, must stand free" (Hagan 56).

Wright called 30-60 the "one-two triangle."

Began hexagon in Honeycomb. "I am convinced that the cross-section of the honeycomb has more fertility and flexibility where human movement is concerned than the square." (Hoffmann 30).

30-60 is angle of mountains in T-West.

Hagan hexagon quite different.

Well conceived "unit system" could "keep all to scale, ensure consistent proportion throughout the edifice, large or small, which thus become, like a tapestry, a consistent fabric of woven, interdependent, related units, however various.

Unit system also simplifies plan.

2300sf (vs 5300 for Fallingwater). Sotheby's says 3600sf.

Polliwog type.

Usonian house as FLW's post-Depression solution to small house. Each unique, but unified by a grammar, a system of ideas. Public and private areas meet at core.

3D grid.

FLW's space is not static. Must move around. Cf. Book of Tea. "True beauty

could only be discovered by one who mentally completed the incomplete.”

Planters that extend at driveway and rear terrace part of FLW’s pulling the geometry into the landscape, “watching out for the ends.”

#### **D4b. Comfort systems : water supplies, lighting, ventilation, heating, cooking**

Systems Notes:

Heating pipe laid on 3ft of blue-stone gravel. Tested for 500lb pressure, then poured in concrete.

Complicated process to install electric and to insert wood 2x12 vertical members into stone.

Hermann Keys increased the number of heating pipes. He inserted ventilation holes in exterior eaves (triangular, like lights), and added ventilation holes to basement through south retaining wall. Keys also added ventilation at top and bottom of all closets.

Bernadine loved the gravity heat. Feet always warm.

Never had any problems!

#### **D4c. Circulation : vertical and horizontal : staircases, corridors, zones of movement, etc.**

#### **D5. Architectural ‘firmitas’**

##### **D5a. Construction materials and techniques**

Notes on Concrete & Masonry:

At first they hoped to haul stone from Fallingwater, but this proved too expensive. Then they found large boulders on another Hagan property. When FLW heard this, he penciled in a number of large boulders at the base of the house, saying “just push them up against the foundation” (Hagan 18). Contractors thought this was crazy, but made a game of hauling large boulders.

Concrete footers poured late 1954. The massive retaining wall along south side was “laid” (Hagan 21). House faces due south for winter sun. Bernadine asked for the huge space under the LR to remain basement, FLW claimed it was cheaper to fill in. Then the concrete back wall of the carport was poured. Work stopped for winter. Davy Davison returned in March 1955 to show Jess Wilson how to lay stone “naturally,” not “dressed..” Also horizontal mortar lines were to carry around the building. Hermann Keys (not FW or Davison) suggested dark mortar to match stone. Heating pipe laid on 3ft of blue-stone gravel. Tested for 500lb pressure, then poured

in concrete. Exterior stone walls were double stone walls with insulation in between. Complicated process to install electric and to insert wood 2x12 vertical members into stone.

Flagstone substituted for red concrete floors in Sept. 1955, heartily approved by Taliesin. Johnson Wax "One-Step" used to treat floors. Hagans worried about too much stone, but expanses of wood and glass sure to make it OK. Hagans worried that concrete would crack. "Hob," next to fireplace contemplated as boulder, but FLW dictated masonry to match.

May 1954, Hagan expresses concern over contractor's estimate of \$124,000 (vs \$60,000 original), because of 13.5 mile distance from Uniontown and "stupendous quantity" of concrete.

Jess Wilson was master stone mason.

"Stickouts" part of FLW's aesthetic. Give walls a natural and lively syncopated rhythm.

Masonry base at times dynamic, "Queen Mary" as Keys said (Hoffmann 56). But also horizontal, like windswept rock (Hoffmann 57).

First exterior perspectives had flagstones combined with smaller stones on base.

Lower walls are 10" veneer of stones on concrete foundation., Above that two layers of stone on 2" insulation.

Recalls "prow" of "Dampfer" Robie House.

Heavy stone is natural heat-sink.

600-800 tons of warm fieldstone.

#### Notes on Windows & Glass

First pattern for clerestory windows was considered too complicated to cut by the mill. A 2<sup>nd</sup> was also unsuitable-it made Bernadine feel as if impaled on a sword. A 3<sup>rd</sup> pattern designed by FLW himself. Patterns taken from several elements in house plan. Bernadine asked to makewood permanently installed, and windows open in, allowing for easier cleaning and cross ventilation. FLW approved, though windows different than most others.

Thermopane (new on market, made by Libbey Owens Ford Co.), but FLW refused, saying glass companies overcharged, and oil was cheap. Corner window would also have been affected. Hagans had 5 mitereed windows. While Hagans at taliesin, Keys at first installed them with metal clamps, which had to be removed. FLW had planned no insect screens, so Coughenour at Eggers designed thin screens. Hagans replaced skylights over DR with thermopane to avoid dripping.

## **D5b. Vertical elements: foundations / load-bearing walls / partitioning walls / windows**

## **D5c. Horizontal elements: floor structures & roof structure**

### Roof Notes:

Only truly finished element in July 1956 was copper roof. FLW had given permission to apply acid to make it blue, but Revere urged them not.

Roof never leaked.

In summer storms, curtains of water fall from roof (no gutters or downspouts.)

Original plans for roof not strong enough to support winds. Several steel members with no supports.

Keys corrected FLW's plans about roof construction; FLW later reprimanded the apprentices back in the office, Curtis Besinger recalled.

Hagans suggested hand-hewn shakes, but FLW insisted on copper for fire safety. In Dec. 1953, Hagans considering flat roof (Hoffmann 21).

FLW called copper "the king of metals" (Hoffmann 42) Liked the verdigree green in conjunction with stone or brick and wood.

Roof at 20 degrees, copper stepped over horizontal battens. Henry Cooper of Uniontown did work.

Form afar, roof and overhang seem to float on two stone piers. An open forest pavilion (Hoffmann 55).

From below prow roof seems more dynamic, with hexagon and irregular geometry. Roof is NOT a lid on the box. "Obvious symmetry usually closes the episode before it begins." (Hoffmann 57).

Horizontal of roof and parapet wall emphasize each other!

Post-1945 Hagans usually had "cathedral ceilings," accentuate space. Origin in Prairie (Coonley). Soft "cap" to space. Inner space always conforms to exterior form.

Linear nature of cypress board ceilings added direction to spaces. Interlocking boards emphasize spiral circulation.

"The reality of a room was to be found in the space enclosed by the roof and walls, not in the roof and walls themselves."

## **E. Room-by-Room Description of the Interior of the House Including Original Furniture**

### Room Notes:

#### ENTRY

In 1954 Hagans asked for more height at entry, because Paul was 6'-2", so

ceiling was raised from 6'-0" to 6'-7", one inch beyond four units.

Entry steps only about 4" tall.

Entry of different stone, not rough. FLW approves.

Low risers slow the walk, notice the masonry and colors and the wood clerestory.

Entry sheltered but not concealed. Connected to carport by covered walk.

No traditional front door. More like a 4-panel glass screen (Hoffmann 62). Side lights sink into stone work.

60 degrees to right is LR, 120 degrees to left is BdRm wing.

Entry "continueds" in the "decks" that encircle the perimeter of whole house, lower area near head. With roof space above. Originates in Prairie House.

#### LIVING ROOM 22'x36'

The living room of Kentuck Knob is one of the most important spaces of the house in terms of its function as a living space as well as its function as a directional space. The living room forms one of the most important spaces in the narrative of moving through the Hagan House as it is both one of the most important living spaces, is both public and private, and is an intermediary zone between entrance and dining room.

The living room is particularly directional in both how it is intended to be occupied and in how inhabitants move through and experience the house and site. As a self-contained space, the living room essentially behaves as a theatre to nature. According to Frank Lloyd Wright's original design, the only built in furniture which is located along the entrance wall, faces a series of floor-to-ceiling height glass panels. These windows look onto a thin terrace space which is shaded by a hexagonal trellis. The thinness of the terrace combined with the hip-height wall/railing and overhanging roof/trellis, forms a transitional zone that frames a panoramic view of the wooded exterior beyond. Although Wright specified that furniture was never to be placed in front of glass wall (the theatre screen), the built in seating, which is still the most prominent seating in the space, ensures that despite how furniture is rearranged, this directional view away from the entrance and to the outdoors will be retained. This directional element, though often hinted at represents an affirmation of Wright's principles that culminated in the Usonian home as it is often lacking in Wright's earlier Prairie designs.

Beyond its function as a contained space, the living room also functions to an extent as the circulation between entrance to dining room, and in this sense becomes a transitional zone between living and dining spaces, imposing a specific sequence in which the home is experienced. When entering the home, one immediately

encounters a small space consisting of a full wall ahead and a low ceiling. Thus, there are two choices; to the left is a dark passageway and blank wall which requires one to turn a 120 degree angle to enter a corridor leading to the private living space including bedrooms, bathrooms, basement entrance and kitchen. To the right is stonework which rounds the corner to a fireplace, with a view of floor-to-ceiling glass doors, the terrace and exterior woodlands beyond, and the intimate seating of the living room. Obviously, Wright intended to use the experience of the living room as a teaser to draw the inhabitant into and through the living room and into the public realm, essentially forcing the inhabitant to forget the more private wing of bedrooms and bathrooms and focus all living activities in the living and dining areas of the home.

When the inhabitant enters the living room, the view is already oriented toward the seating zone and the glass doors to the exterior. To the adjacent right are the only built in seats in the home and to the adjacent left is located a stone fireplace which functions as an extension of the kitchen wall. Across the room and slightly to the right a built in planter extends through the glass wall to form a mirrored planter with similar plantings on the opposite side, dissolving the separation between interior and exterior living spaces. The living room ceiling peeks with the roof and is paneled with the same cypress used for shelving. This aesthetic gives the appearance of the underside of an overturned row boat. Above the built in seating are a series of built in shelves that extend up from the seats to the clerestory windows which form an open band of light around the roofline. The shelves back the exterior stone wall directly, demonstrating the use of stone not only as structure but also as interior décor.

The fireplace essentially has two plans as the chimney overlaps and extends out farther than the base. The fireplace angles toward the glass doors to the terrace. With this move the fireplace implies that the terrace is as much a part of the living space as the interior. The fireplace is constructed of the same masonry field stone as the exterior walls, thus unifying the exterior and interior. The fireplace functions both as fireplace and wall as it folds in toward the entry to create an experience of intimacy at the entry that gradually expands into a more open and airy living room faced on one side with stone and the other, light.

Light is filtered into the home in a variety of means of creating ornamentation with origins in the natural environment. The rear of the living room is established by Wright through two means of orientation; a row of built in seating facing the terrace and a series of floor to ceiling windows to which this seating faces. Above the seats, which are located along the face of the entry wall into which the doorway is set, is a row of clerestory windows. Wright uses these windows as light filters through the

application of what he deemed “stained glass for the average (??) man;” wood cut-outs featuring a series of geometric forms in different compositions and orientations. Speculation about the inspiration of these cut-outs credits a number of different sources, most remarkably the profile of the Laurel Highlands, the region of Western Pennsylvania in which Kentuck Knob is situated. Despite their creative origin, these cut-outs are without a doubt the geometric abstraction of the obtuse and acute angles of which the house is composed.

Wright uses a series of architectural themes which are reinvented in different parts of the home. The window cut-outs which are so important in manipulating light at the rear of the living room are reinterpreted in Wright’s interpretation of a trellis. According to a source at Kentuck Knob, Mrs. Hagan requested a trellis as part of the original design of the home. Wright’s interpretation of a trellis makes a unique contribution to the union of terrace and living room. Functioning essentially as a sundial, the terrace roof features a number of large hexagonal “cut-outs” which creates, when the sun shines, hexagonal lights that line the length of the terrace. As the seasons pass however, these hexagonal lights migrate from the terrace and through the glass wall into the living room itself. This small detail not only marks seasonal change and unites architecture and nature to create an ornamentation of light, but also functions to complete the connection between interior and exterior which is already visually delineated. The use of these hexagonal “cut-outs” when seen in this manner appear to be directly derived from the wood cut-outs forming the “stained glass for the poor man” that filter light at the opposite side of the home, utilized in that case in a vertical rather than horizontal orientation.

Artificial lighting is handled addressed in the living room in two ways. Uplighting is provided around an interior band that surrounds the base of the living room ceiling and is located above the clerestory and floor to ceiling glass doors. This uplighting gently projects an ambient light onto the ceiling surface, making the wood glow. Along the glass doors which lead to the terrace are located a series of triangular cutouts into which are fit a simple light bulb. This simple built-in lighting technique provides more intense down lighting reminiscent of the lighting of a stage.

The floor of the living room was intended to be concrete with hexagonal detailing outlining the building unit. Wright originally designed the floor to be finished with red paint but was finished instead with flagstone at the Hagan’s request. Wright was also consulted concerning the carpeting that was to be installed in the living room and he requested that a triangle be cut out of the rug in line with the angles of the fireplace. This slight move finishes the directional nature of the living room as carpet forms two points, one that leads to and from the entry and the other that leads

to and from the dining room, thus completing the narrative.

#### Living Room Notes:

Sept. 1953, Hagans asked for more space in LR, Wright added a module in length.

Upon coming to low entranceway, gaze drawn to great room. "Great space for a party" (Hagan 144). Like being in a treehouse, but safe with a fireplace.

Van Trump calls LR "one long unbroken space with a long continuous sofa, which faces the plate-glass expanses." (Hagan 158). Chief ornament is the view of the mountains, a kind of vast mural.

Couch 28ft long.

#### TERRACE

The rear terrace in FLW's usonian houses built on hills is almost always "private," with no access to rear yard.

Roof extends 9ft past glass doors in overhang.

#### DINING ROOM 12'x16'

Sept. 1953, Hagans asked to expand DR, enclosed part of terrace.

Ceiling lower in DR, make meals more intimate, enjoyable. Door to DR terrace opens out to ground level (diff. than LR treehouse). Entertaining was fun.

DR table can be arranged to fit various numbers of guests.

Hagans replaced skylights over DR with thermopane to avoid dripping.

LR grew longer from Feb. Plans to Mar. Plans. To working drawing plans....

Original plan had terrace at west end. Changed to planter at end of LR.

#### KITCHEN (11'x11')

Bernadine liked kitchen in Guggenheim usonian.

Preparing meals was easy in the well-designed kitchen.

The 21" wide hallway from DR to hallway seemed useless, but FLW insisted "the center core, the heart of the house, must stand free" (Hagan 56).

Kitchen was supposed to be covered with tent-shaped glass with chicken wire. A plastic bubble (from WWII bombers) substituted. Too much light. So a 60-120 wood grate with small aluminum louvers ("Bark-light") was inserted, still allowing view to sky. "Kitchen was delightful" (Hagan 53). Choice of countertops was Bernadine's, stainless (she had same in old house), while FLW was using red "Micarta." Elkay did not want to be liable for measurements, but Amadee took responsibility, and it worked. Large oven. Counter-top cooktop by Frigidaire (Swedish design). White

fridge sprayed tan to look correct. Hagans wanted real cork floor, not concrete or rubber as FLW wanted. Armstrong insisted on sealed cork. Comfortable floor. In winter the skylight would freeze, then thaw when Bernadine cooked, and it would “rain” (Hagan 107-8).

Van Trump calls kitchen as (medieval) “keep” (Hagan 158). Reinforces the impression of the “sacrosanct, one remembers early Christian baptistries... sacred place to some immemorial god of the hearth” (Hagan 158).

Wright had commented that kitchens in his modern houses were something to behold (Hagan 169).

Cork tile floor is only non-cypress.

Kitchen tower visible upon entry, backdrop of stone to entry. Tallest point of house.

#### BEDROOMS (MBR 16'x16', others 12'x12' and 12'x14')

The house at Kentuck Knob can essentially be broken down into two main parts, the public sector and the private sector. While the living room comprises most of the public sector, the private sector is comprised of bedrooms. The bedroom wing at Kentuck Knob is a skewed continuation of the hexagonal grid, angling itself off of the stone kitchen core in order to create the exterior graveled courtyard. While the living room and its expansive terrace rest on a massive stone wall built out of the ground, the bedroom wing itself lies tucked into the surrounding landscape, protected from the elements and visitors. From the front graveled court, a guest’s first glimpse at the actual residence, the only break from a heavy stone wall and deep overhangs are the front entry doors, framed in tidewater red cypress wood. Upon closer examination, the shadows cast onto the walls from the roof reveal themselves to be clerestory windows with decorative wood cutouts, bringing a sense of scale to the otherwise elusive nature of the house.

In contrast to the more monolithic quality of the front façade, the rear façade features many more openings to the outdoors. The walls of the public section of the house seem to disappear as it opens up to a large and expansive terrace suspended above the ground. Unlike the openings along the public sector, which allow for people to cross between the indoor and outdoor, the walls along the private section of the house do not allow for human passage. Instead, operable clerestory windows allow for natural ventilation, but still maintain necessary privacy from the outdoors. These windows do not feature any of the decorative wood cutouts that screen the public entrance courtyard.

Passive solar design is somewhat prevalent within the Hagan House. All of the

main living areas receive south light, while generous overhangs protect the walls from the sun and allow for openness between the indoor environment and the exterior terraces even in inclement weather. In the bedroom wing, the east facing larger clerestory windows allow the morning sun to wake the sleeping guest, while the westward stone wall prevents the bedrooms from overheating from the harsh afternoon sun. Operable clerestory windows along both sides of the room draw fresh air and natural breezes through the house.

Wood as a building material is much more prevalent in the bedroom wing of the house. Many interior partitions paneled in tidewater red cypress make up the individual bedrooms within the private wing. Careful attention to the directionality of the grain of wood exists throughout, as all operable vertical elements, such as doors, have vertically running grain, whereas all other wood paneling is horizontal, emphasizing the horizontality of the house and also leading the eye across to opening to the outside.

Though the bedroom wing is certainly the private wing of the house, it can be divided into two main components, the bedrooms for the family and the guest area. The basement door can be used as a divider for these two segments of the house, moving this line of public and private from the beginning of the bedroom wing to the family sector of the bedroom wing. The simple movement of a door provides guests with a definite boundary of public and private, while providing an inventive solution to separating guests from their hosts within a small residence.

The largest bedroom in the house, the master bedroom acts as the bookend to the private section of the house, which securely anchors the residence into the hill. Open vaulted ceilings seem to enlarge the space and allow for light reflections to enter deep into the room. The large clerestory windows open up directly over into the hill, almost as if to allow the occupant to have fresh flowers spilling directly from the earth through the open window. The master bedroom is the only room within the bedroom wing to feature a stone fireplace. This fireplace serves two functions, to anchor the end of the house and to provide a focal point for the bedroom and the occupants within. The fireplace itself has a much more vertical masonry opening, more like a door than a traditional mantle piece. Perhaps this is to emphasize some verticality in an extremely horizontal house or maybe just to mimic the wardrobe and cabinetry doors elsewhere in the room. This fireplace could also serve to make the house seem larger as it appears to be a doorway in the distance when viewed from the hallway. Built in cabinetry and wardrobes control the positioning of the bed and other furniture within the room as well as allowing the exterior walls to stand out, as the wardrobes do not extend all the way up the ceiling, allowing for the line of

clerestory windows to continue uninterrupted across the entire façade.

The middle bedroom is the other bedroom dedicated to the private family. Like the master bedroom, it also has built in wooden cabinetry and wardrobes. Twin beds face eastern clerestory windows that open out into an outdoor terrace with a landscaped fountain to provide tranquil white noise. Servicing the middle bedroom and the guest bedroom, the master bathroom features the only right angle throughout the entire house, when it was outfitted with a standard rectangular bathtub.

The hallway connecting this sequence of rooms is quite narrow and compressed, with bookcases protruding from the exterior stone wall into the space. Directly opposite these bookshelves, the pattern of the applied wood finish plays with the pushing and pulling notions of movement across the hallway. The jutting out of the bookcases seems to push in the finished panels across the hallway. A lowered flat ceiling draws people through the space to more inviting spaces in which to rest. The lowered ceiling, entrance of light only on one side through wood cutouts and the similar materials along many of the sides makes the hallway seem like an underground entrance to a distant cave room, compressing residents until finally releasing them into a more open space.

The guest bedroom and bathroom comprise the second section of the bedroom wing in Kentuck Knob. The guest bedroom itself is a complete hexagon, giving a guest a quick and abridged version of a lesson in the grid system of the entire house. The guest bedroom also features a disappearing corner window, another lesson into the thoughts and developments of the architect. An extremely narrow hallway connects the dining room with the guest suite, discouraging frequent pass-thru, thus offering the guest privacy though near the center of the house. As in all of the other bedrooms, the guest suite has similar wood patterns and east facing clerestory windows. While the master bathroom does not concede with the hexagonal grid, the guest bathroom is a prime example of the hexagonal grid complete with an angled shower.

Bedroom Notes:

Keys also added ventilation at top and bottom of all closets.

Van Trump says burried BR wing balances lofty stone podium which carries the LR.

## BASEMENT

FLW agreed to provide a basement (rare in his buildings), since Bernadine lived far from grocery and was prone to be snowed in.

Bernadine asked for the huge space under the LR to remain basement, FLW claimed it was cheaper to fill in.

Early plan sacrificed much space in kitchen for basement stair. Later shifted into bedroom wing, a "victory" for Bernadine. (Hoffmann 35).

#### CARPORT

Bernadine mentioned painting as a hobby, and he replied "Painting is debilitating" (Hagan, 8).

Roof measures 6'-4", each column measures ½ unit.

Originally carport end in triangular pump roof. Gradually expand for painting studio. Interior lined with old weatherboard from torn-down barn.

Carport connected to entry by covered walk.

Carport very front and center in design. Suburban?

Bernadine said she used shed because there was no place else. Wright was very pessimistic about painting. Said many painters, including Michelangelo and Corbusier, turned from painting to architecture.

#### **E1. special attention to wood carving applications**

Furniture Notes:

Hagans had "decisive ideas" about what they wanted for furnishings. Proved to be a good match for FLW house (Hagan 150).

They were told to go to Georg Jensen in NYC for furniture (FLW spending much time in NYC for Guggenheim). In June 1956 went with Kaufmann Jr. And NYC designer Paul Mayen. Bernadine liked a Hans Wegner chair (\$250, teak with cane seat), wanted 8 but ordered 1. Also chose 2 Wegner black leather chairs and stools, and a two-seater and armchair by Finn Juhl. Went to Lars Larsen studio for fabric for long bench. Ordered 40 yards of pattern called "Granit" to be woven in warm gold. Also chose 3 brass lamps from Hansen, and three brass bed lamps. Needed LR table and entry chest. Article in NY Times [sic!] introduced them to George Nakashima. Stopped by on way home. Nakashima, an architect, did not care to work with FLW's hexagons. Hagans order eight \$38 DR chairs, and three stools, all walnut with grass seats. Nakashima designs LR table and entry chest with angled sides after receiving floor plans. Order placed June 1956, delivered Oct. 1956.

End of winter 1956, called Taliesin for furniture and carpet. FLW agreed to send plan, Bernadine could choose color. Mr. Russell of Oriental Carpets at Kaufmann's came with samples. FLW's plan had covered all of floor with carpet. Russell insisted

on moving it back from fireplace, 2ft. Turquoise in BR, burnt orange for center bedroom, soft yellow for guest BR. Had wanted white for LR, but went with warmer buff with peach cast.

Difficult to “decorate” a FLW house (Hagan 121).

Dec. 1958 Hagens ask for wood screen. Feb. 1959 Masselink designs cypress wood screen with stained glass inserted in perforations, FLW liked it so much, he kept it. Hagens saw it when the visited Taliesin. When FLW died, Olgivanna sold it to the Hagens. (Hagan 102-4). Patterns derive from angles of plan (Hoffmann 97)

In 1969 Hagens visited Nakashima and purchased an oak burl table to replace fragile cypress original. Installed Oct. 1970, with easier care. Slightly higher than cabinet.

Quiet colors of Appalachian winters in symphony with wood and stone materials, beiges and soft ochres were used for upholstery. Neutral background artfully highlighted with bright colored accents, a rich mix of colors and textures (Hagan 150). Many fabrics woven by Bernadine. Formal dinnerware put aside: chose hand-woven Danish linens, Jensen silverware, dark blue stoneware dishes, antique Imari and Raku, and Bernadine’s Japanese inspired flower arrangements.

In Nov. 1955 asked for low table to go with couch. FLW referred them to Heritage Co. furniture line (Hagan 200).

Never felt the need to change furniture. Triangular lights easy to change bulb, and windows easy to clean.

In addition to built-ins and DR table, there is a hexagonal table near entry, and a weed holder that FLW gave Hagens.

FLW always black and blue from bumping into his own furniture.

## **E2. references to and influences from stylistic elements, precedents, other arts, or other regions**

Precedent Notes:

Fallingwater

Hagens saw June 1953 issue of House Beautiful, with Mumford article. Liked “treatment of walls and ceiling” in unnamed house in article.

Bernadine liked kitchen in Guggenheim usonian. Impressed with crowds. Noted comment from African American woman that there is no room for baby carriage. French doors, narrow halls, DR near kitchen, etc.

“Sixty Years of Living Architecture” exhibit.

After first visit to Taliesin, they visited Johnson Wax, Herbert Jacobs, Richard Smith, and Unitarian Meeting (last two had stone walls and 30-60 plans. Smith house had trellis and dentils. Meeting had copper roof.

Llewelyn Wright house in Bethesda consulted for varnish  
T-West, Taliesin.

**F. Conclusions on possible 'typology' of specific architectural elements**

**APPENDIX V: COURSE MATERIALS, "FRANK LLOYD WRIGHT" S'05, CMU**

# F.L. Wright: Precedent, Analysis & Transformation

CMU, Arch 48-441 (Project Course)  
Spring 2005, M/W/F 11:30-12:20, CFA 211

Prof. Kai Gutschow  
Email: gutschow@cmu.edu  
Off. Hr: M/F 12:30-1:30pm & by appt. in MM307

(11/12/05)

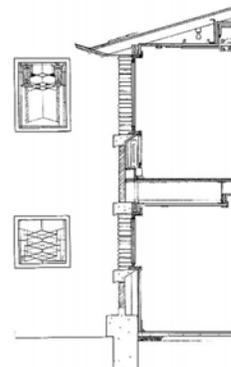
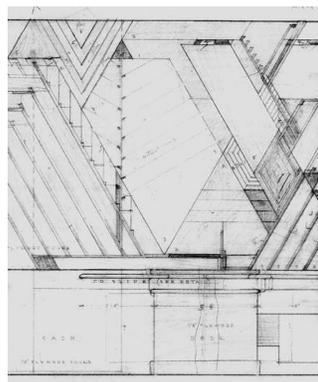
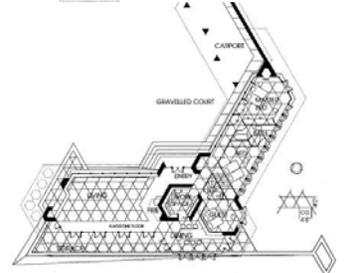
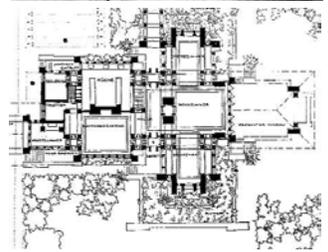
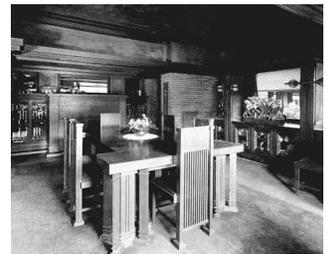
## Syllabus

"Frank Lloyd Wright: Precedent, Analysis & Transformation" is an architectural history course that seeks to understand and learn from the design principles of F.L. Wright through a case study method. After a survey introduction to the career and bibliography of F.L. Wright and investigations of several important houses from throughout his career, the class will select one Wright house to analyze and work with in detail for the rest of the semester. The main purpose of the analysis will be to more fully understand a design of F.L. Wright's, especially the interior woodwork, and see if it is possible to uncover "design principles" or "systems" that act like a "kit of parts." A second phase of the course will investigate how these principles might be used to generate or "grow" new designs through various transformations.

The analysis will be broad in scope in order to get at the heart of Wright's complex and intriguing designs. Students will be asked to take field trips to study the building in person, analyze detailed construction and preservation documents, describe the designs in words, drawings, and other media, construct large-scale and analytical models, invent innovative diagrams and graphic representations, abstract and synthesize the designs with reference to nature, geometry and the human body, interpret and interpolate the designs through computer graphics software, and find other innovative ways to explore and analyze the Wright house. In addition, the class will read essays by F.L. Wright on issues such as the "nature of materials" and "breaking the box," read a broad spectrum of existing studies and analyses of Wright's work, as well as explore related topics that may have influenced Wright's work such as his childhood memories of Gothic cathedrals and Froebel blocks, his love of nature and Japanese design, his discovery of Mayan ornament and an "American Architecture," his relationship to the Arts & Crafts, Craftsman, and Roycroft movements, his awareness of the influence of the machine, mechanization and mass production on all cultural production, his desire to solve the problem of housing for the low and middle-income American, and much more. The many references and analysis approaches will then be synthesized into a comprehensive case study analysis report before undertaking preliminary investigations of new designs made possible by the analysis.

This is a "project course" that will explore architectural history through a unique "hands-on" method of learning. It will require much initiative, creativity and synthesis. It will demand cooperation and a teamwork mentality from all the students, the research/teaching assistants, and the instructor. Although a general structure and the final goals for the course have been set, the precise nature of our analysis and learning will evolve over time as we make new discoveries and determine new paths to understanding Wright.

Initiative and special funding for the course came in part from a grant from the Enkeboll Foundation of the Arts and Architecture to study the woodwork in several case studies of historic architecture.



**Research/Teaching Assistants:** Rebecca Rahmlow <rrahmlow@andrew.cmu.edu>  
Jennifer Verbeke <jverbeke@andrew.cmu.edu>

**Contacts:** Use Blackboard to email anyone in the class or the RA's

**Initial Schedule of Seminar:** Topics, Readings, Assignments, Deadlines, etc

**Abbreviations:** \* = Most important reading!! Pay particular attention!  
**ER** = E-Reserve Reader (see CAMEO reserves)  
**T** = Required textbook  
 Autobiography = FLW, An Autobiography 2<sup>nd</sup> ed. (NY: 1943) (Rsv.720.8 W94 )  
 FLWCW = FLW Collected Writings 5 vols. (Rsv: 720.8 W94WCO VOLS. 1 - 5)  
 Curtis = W. Curtis, Modern Architecture since 1900 3rd ed. (1996)

**Note:** This schedule is subject to change. See handouts for changes.

### Week 1

- Mon. Jan. 10 Course Introduction, Expectations, Assignments  
*Assign:* Student teams to do research and analyze Martin Hse. (Prairie) & Pope-Leighy Hse. (Usonian), then create "complete bibliography" and prepare Powerpoint presentation and summary handout on analysis on each house.  
 \* *Handout:* from W.A. Storrer, The FLW Companion (1992) (Ref. 720.8 W94STAAA)  
*Overview Readings:*  
**ER:** T. Hines, "Review Essay" JSAH 54:4 (Dec. 1995): 467-476  
**ER:** H.A. Brooks, "FLW," Encyclopedia of World Art (1967) pp.857-869.  
*Other Optional FLW Career Overviews:*  
 -- V. Scully, FLW (1960) pp.11-32  
 -- L. Roth, Concise History of Amer. Arch. pp.200-211, 254-262, 292-294  
 -- P. Sprague, "FLW" Dictionary of Art, vol.33  
 -- W. Curtis, Modern Architecture since 1900 3rd ed. (1996) Chs.7,18  
 -- K. Frampton, Modern Architecture 3rd ed. (1992) Chs.3,21  
 -- Video: Ken Burns, "FLW" (1998, at Hunt Library)
- Wed. Jan. 12 Lec: Search for an American Style (Guest Lecture by Diane Shaw)  
*Readings:*  
**ER:** V. Scully, "American Houses, Thomas Jefferson to FLW" in The Rise of an American Architecture ed. E.J. Kaufmann (1970): 163-190ff.
- Fri. Jan. 14 Lec. The Domestic Suburb (Guest Lecture by Diane Shaw)  
*Readings:*  
 \* **ER:** G. Wright, "Victorian Suburbs and the Cult of Domesticity," Building the Dream (1981) Ch.6=pp.96-113

### Week 2

- Mon. Jan. 17 **NO CLASS**, Project Work Session  
 Each group to meet with TA's (in class, library, studio or cafe) to organize and prepare student presentations
- Wed. Jan. 19 Class Presentations on Martin House  
**DUE:** Student Reports on Martin Hse. & Pope-Leighey Hse.
- Fri. Jan. 21 Class presentations on Pope-Leighey House

**Week 3**

Mon. Jan. 24 Lec: FLW Youth, Training, Froebel

*Readings:*

- \* **ER:** W. Cronon, "Inconstant Unity" in T. Riley, FLW (1994), pp.8-31  
**T:** Writings on Wright (1981) pp.23-27 (O. Wright)

Wed. Jan. 26 Discuss readings: "Art & Craft of the Machine"

Lec: FLW Early Influences: Viollet-le-Duc

*Readings:*

- \* **ER:** FLW, "Art & Craft of the Machine," (1901) in FLWCW vol.1, pp.58-69; in Kaufmann & Raeburn, eds. FLW Writings & Buildings (1960) pp.55-73  
**T:** Writings on Wright pp.103-113 (R.C. Spencer, H. Monrow)

Fri. Jan. 28 Lec. FLW Influences: Hugo, Jones, Arts & Crafts

**Week 4**

Mon. Jan. 31 Lec: Silsbee & Sullivan's Ornament

Wed. Feb. 2 Lec: Columbian Exposition & Influences: Classical, Japanese, Mayan

*Readings:*

- ER:** D. Tselos, "FLW and World Architecture," JSAH 28:1 (Mar. 1969): 58-72

Fri. Feb. 4 Lec. Earliest Houses (Own House, Winslow)

*Readings:*

- ER:** FLW, "Ausgeführte Bauten" (1910) in FLWCW vol.1, pp.101-115.

**Week 5**

Mon. Feb. 7 **NO CLASS**, Mid-Mini Break  
(Research trip to Buffalo, Martin House)

Wed. Feb. 9 Prairie House I (Martin House)

*Readings:*

- ER:** FLW in Ladies Home Journal (1901/07) in FLWCW vol.1 pp.73-77, 81-83  
Includes essays: "A Home in A Prairie Town," (1901) pp.73-75; "A Small House with `Lots of Room in it'," (1901) pp.76-77; "A Fireproof House for \$5,000," (1907) pp.81-83.  
**ER:** G. Wright, "FLW & Domestic Landscape," in Riley, FLW, pp.80-95.

Fri. Feb. 11 Class presentation on comparative analyses  
**DUE:** Draft of house analysis with respect to theme

**Week 6**

Mon. Feb. 14 Lec: Prairie House II (Robie House)

*Readings:*

- \* **ER:** FLW, "Cardboard House" (from Mod. Arch., 1931), in FLWCW vol.2 pp.53-59; also in FLW Writings & Buildings pp.37-55  
**T:** Writings on Wright pp.33-50 (E.R. Streich, F.C. Robie), 83-92 (White), 155-193 (R. Banham, R.C. McCormac, H.A. Brooks, N.K. Smith)

*Optional:*

- ER:** W. Jordy, "The Organic Ideal, FLW's Robie House," in Jordy, American Buildings and their Architects vol.4 (1972) Ch.3 = pp.180-216.

Wed. Feb. 16 Lec: Concrete (Larkin & Unity)  
Discuss Readings "In the Cause of Architecture"

*Readings:*

- \* **ER:** FLW, "In the Cause of Architecture," (1908) in FLWCW vol.1, pp.84-100  
**ER:** Frampton, "Modernization and Mediation," in Riley, FLW, excerpt pp.58-67  
**T:** Writings on Wright pp.115-117 (R. Sturgis)

- Fri. Feb. 18 Lec: Building a New Home: Taliesin  
**DUE:** Analysis Report on House vs. Theme  
*Readings:*  
**ER:** T. Riley, "Landscapes of FLW" in Riley, FLW, pp.96-107

**Week 7**

- Mon. Feb. 21 Lec: Grand Manner Plans: Imperial Hotel & Midway Gardens  
*Readings:*  
**T:** Writings on Wright pp.1-18 (Ashbee, Mendelsohn, Woolcott, Anon.)

- Wed. Feb. 23 Lec.: California & Desert Diagonals: the Projects of the 1920s  
*Readings:*  
**T:** McCarter, FLW, Ch.9

- Fri. Feb. 25 Lec.: Hagan House  
*Handout:* Hagan House Plans  
*Readings:*  
**T:** Hoffmann, FLW's House at Kentuck Knob (read whole book)

**Week 8**

- Mon. Feb. 28 Guest Lec.: Hexagons, by Charles Rosenblum
- Wed. Mar. 2 Hagan House Discussion  
*Readings:*  
**ER:** R. McCarter, "The Integrated Ideal: Ordering Principles in the Arch. of FLW," in FLW: A Primer of Arch'l Principles

- Fri. Mar 4 **NO CLASS** Mid-Semester Break

- Mar. 7-11 **SPRING BREAK**

**Week 9**

- Mon. Mar 14 Lec.: California and Textile Block Houses  
*Readings:*  
 \* **ER:** Frampton, "Modernization and Mediation," in Riley, FLW, excerpt pp.67-71

- Wed. Mar. 16 FLW School of Architecture  
*Readings:*  
*Handout:* "FLW to Open a Bookless School" NY Times (Aug. 1932)  
**T:** Writings on Wright pp.93-101 (Tafel)  
 \* **ER:** FLW, "The Hillside Home School," (1931) in FLWCW vol.3, pp.39-49  
**ER:** D.L. Johnson, "Apprenticeship," in FLW vs. America (1990) Ch.5=pp.45-64  
**ER:** H. Saalman, "Arch'l Education at Carnegie Tech, 1905-1977"

- Fri. Mar. 18 Fallingwater & European Modernism  
*Readings:*  
 \* **ER:** Alofsin, "FLW & Modernism," in Riley FLW, pp.32-57  
**T:** Writings on Wright pp.69-72 (Kaufmann)

- Sun. Mar. 20 **FIELD TRIP** Kentuck Knob, in-depth tour, 9:00-12:00  
 Fallingwater, regular tour, 1:00

**Week 10**

- Mon. Mar. 21 Broadacre City  
*Readings:*  
**ER:** FLW, excerpt from "The New Frontier," in FLWCW vol.4, pp.60-65  
**T:** Writings on Wright 195-206 (March)

*Optional*

**ER:** FLW, The Living City (1958) skim entire book; and read closely in FLWCW vol 5, pp.272-276, 335-338

Wed. Mar. 23 Usonian Houses (Rectangular: Jacobs, Pope-Leighy, Rosenbaum, etc)

*Readings:*

**T:** Writings on Wright pp.51-68, 75-81 (Pope, Chadwick, Leighy, Afflek, Hanna)

\*

**ER:** J. Burns, "Usonian Houses: FLW's Vision of Affordable Housing" in Yesterday's houses of Tomorrow ed. H.W. Jandl (1991) (728.0973 J33Y)

*Optional*

FLW, Natural House (1954) skim book, esp. "Usonian I", "Usonian II" (Res. 728.08 W94N); also as FLWCW vol.5 pp.77-127 (Reserve).

Fri. Mar. 25 Class Review on Hagan House Analysis

**DUE:** Hagan Research Project Draft 1

**Week 11**

Mon. Mar. 28 Usonian Houses II (Hexagonal / Triangular: Hanna, Auldbrass, etc.)

Wed. Mar. 30 Johnson Wax & Wingspread

*Readings:*

**ER** Frampton, "Modernization and Mediation," in Riley, FLW, excerpt, pp.71-77

Fri. Apr. 1 Taliesin West

*Readings:*

\*

-- N. Levine, Arch. of FLW, Ch.9

**Week 12**

Mon. Apr. 4 Guggenheim

*Optional:*

-- Levine, Arch. of FLW, Ch.10, **OR:** W. Jordy, "The encompassing Environment of Free-Form Architecture," in Jordy, American Buildings and their Architects, vol. 5 (= The Impact of European Modernism in the mid-twentieth Century) (1972) pp.279-360

Wed. Apr. 6 FLW's Pittsburgh Plans & Late Projects

*Optional:*

-- R. Cleary, "Kaufmann, Wright & Pittsburgh," in Merchant Prince & Master Builder (1999) Ch.3 = pp.53-66.

Fri. Apr. 8 Class Review on Hagan House Analysis

**DUE:** Hagan Research Project Draft 2

**Week 13**

Mon. Apr. 11 **NO CLASS**

Wed. Apr. 13 Hagan House Analysis Discussion

Fri. Apr. 15 **NO CLASS**, Spring Carnival

**Week 14**

Mon. Apr. 18 Intro. Hagan Analysis & Transformation Project

**DUE:** Draft of Context Magazine Images

Wed. Apr. 20 Legacy I (Taliesin Architects, Taliesin Fellows)

Fri. Apr. 22 Legacy II (Goff, Prince, Lautner, "Critical Regionalism")

**Week 15** (Review Week)

Mon. Apr. 25 Legacy III (Birkets, Domino's)

Wed. Apr. 27 IN-CLASS Discussion on "Transformation Exercise"

Fri. Apr. 29 Legacy IV (Contemporary Trends)

**Exams**

Mon. May 8 **DUE:** Final Hagan Research, Analysis and Transformation Project

**Bibliography:** (from Neil Levine, The Architecture of FLW (Princeton 1996) pp. 505-506.

## Bibliographical Note

This bibliography does not list all the published and unpublished material used in the research and writing of this book. The complete documentation of works and sources is recorded in the notes. The purpose of the following compendium is to provide a broad and concise overview of the Wright literature and archival collections that may be most useful for further research and study.

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### Monographs and General Art Historical Studies

The essential documentation of Wright's entire corpus of buildings and projects is:

Bruce Brooks Pfeiffer and Yukio Futagawa, eds., *Frank Lloyd Wright*. Tokyo: A.D.A. EDITA, 1984-88. Vols. 1-8, *Monograph*; vols. 9-11, *Preliminary Studies*; vol. 12, *In His Renderings*.

Until this twelve-volume series containing plans, drawings, and photographs, as well as descriptive texts, became available in the mid-1980s, the fundamental work covering Wright's output up to 1941 was:

Henry-Russell Hitchcock. *In the Nature of Materials: The Buildings of Frank Lloyd Wright, 1887-1941*. New York: Duell, Sloan and Pearce, 1942. Rpt., with a new foreword and bibliography by the author, New York: Da Capo Press, 1975.

The Hitchcock text remains an authoritative analysis of Wright's career and formal development. Other general studies that offer significant interpretive advances are:

Bruno Zevi. *Frank Lloyd Wright*. Milan: Il Balcone, 1947.  
 Vincent Scully Jr. *Frank Lloyd Wright*. Masters of World Architecture Series. New York: George Braziller, 1960.  
 Norris Kelly Smith. *Frank Lloyd Wright: A Study in Architectural Content*. Orig. pub. 1966. Rev. ed. Watkins Glen, N.Y.: American Life Foundation & Study Institute, 1979.

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### Studies of Individual Buildings or Groups of Buildings

Most important studies of Wright since the late 1970s have focused on a single period, an individual building, or a group of typologically related buildings. References to these writings will be found in the relevant notes. For convenience, the following is a list of notes containing bibliographies for buildings or projects discussed at some length in the text:

Oak Park House and Studio: Chapter I, note 19; Chapter II, note 5.  
 Winslow House: Chapter I, note 39.  
 Willits House: Chapter II, note 21.  
 Larkin Building: Chapter II, note 33.  
 Unity Temple: Chapter II, note 40.  
 Robie House: Chapter II, note 56.  
 Taliesin: Chapter IV, note 3.  
 Imperial Hotel: Chapter V, note 2.  
 Hollyhock House and Olive Hill Cultural Center: Chapter V, note 41.  
 Textile-block houses and designs: Chapter VI, notes 13, 17, 25.

Johnson Death Valley Compound: Chapter VI, notes 43, 46.  
 Ocatilla and San Marcos-in-the-Desert Hotel: Chapter VII, notes 45, 59.  
 Broadacre City: Chapter VII, note 21.  
 Fallingwater: Chapter VII, note 32.  
 Taliesin West: Chapter IX, note 1.  
 Johnson Wax Company: Chapter X, note 20.  
 Florida Southern College: Chapter X, note 33.  
 Guggenheim Museum: Chapter X, notes 40, 130, 167, 188.  
 Morris Shop: Chapter XI, note 1.  
 Masieri Memorial: Chapter XI, notes 38, 50.  
 Baghdad Opera House, Cultural Center, and University: Chapter XI, notes 57, 66, passim.  
 Marin County Civic Center: Chapter XI, notes 124, 130.

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### Biographies

The biographical component of the study of Wright's architecture has always been an important one. Three recent biographies stand out either for their critical approach to the subject or for the new information they provide:

Robert C. Twombly. *Frank Lloyd Wright: His Life and His Architecture*. New York: John Wiley & Sons, Wiley-Interscience Publication, 1979. Rev. and exp. version of *Frank Lloyd Wright: An Interpretive Biography*. New York: Harper & Row, 1973.  
 Brendan Gill. *Many Masks: A Life of Frank Lloyd Wright*. New York: G. P. Putnam's Sons, 1987.  
 Meryle Secrest. *Frank Lloyd Wright*. New York: Alfred A. Knopf, 1992.

For other biographies, see Introduction, note 19.

For published correspondence, talks, interviews, miscellaneous writings, and personal recollections of those who knew and/or worked with Wright, see Introduction, note 15, and Chapter XI, note 3.

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### Significant Publications of Wright's Work during His Lifetime

Among the most important primary sources for understanding Wright's architecture in its historical context are the publications of his work in his lifetime. Key among these are:

Robert C. Spencer Jr. "The Work of Frank Lloyd Wright." *Architectural Review* (Boston) 7 (June 1900): 61-72.  
 Frank Lloyd Wright. "In the Cause of Architecture." *Architectural Record* 23 (March 1908): 155-221. Repr. in Frederick Gutheim, ed., *In the Cause of Architecture, Frank Lloyd Wright: Essays by Frank Lloyd Wright for Architectural Record, 1908-1952*. New York: Architectural Record Books, 1975.  
 ———. *Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright*. Berlin: Ernst Wasmuth, 1910[-11]. Republished in Japanese (1916), German (1924, 1986), and English. The American editions have carried the following titles: *Buildings, Plans, and Designs*. New York: Horizon Press, 1963; *Studies and Executed Buildings by Frank Lloyd Wright; Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright*. Palos Park, Ill.: Prairie School Press, 1975; *Drawings and Plans of Frank Lloyd Wright: The Early Period (1893-1909)*. New York: Dover, 1983; and *Studies and Executed Buildings by Frank Lloyd Wright*. New York: Rizzoli, 1986.  
 ———. *Frank Lloyd Wright: Ausgeführte Bauten*. Berlin: Ernst Wasmuth, 1911. Republished in English as *Frank Lloyd Wright: The Early Work*. New York: Horizon Press, 1968; and *The Early Work of Frank Lloyd Wright: The "Ausgeführte Bauten" of 1911*. New York: Dover, 1982.  
 H[endrikus] Th[eodorus] Wijdeveld, ed., *The Life-Work of the American Architect Frank Lloyd Wright*. Santpoort, Holland: C. A. Mees, 1925. Orig. pub. "Frank Lloyd Wright." *Wendingen* 7, nos. 3-9 (1925): 1-164. Repub-

lished as *The Work of Frank Lloyd Wright: The Wendingen Edition*. New York: Horizon Press, 1965; and *Frank Lloyd Wright: The Complete "Wendingen" Series*. New York: Dover, 1992.

H[einrich] de Fries, ed., *Frank Lloyd Wright: Aus dem Lebenswerke eines Architekten*. Berlin: Ernst Pollak, 1926.

Jean Badovici. "Frank Lloyd Wright." *Architecture Vivante* 8 (Summer 1930): 49–76.

"Frank Lloyd Wright." *Architectural Forum* 68 (January 1938): 1–102. Entire issue devoted to Wright.

"Frank Lloyd Wright." *Architectural Forum* 88 (January 1948): 65–156. Entire issue devoted to Wright.

Werner M. Moser. *Frank Lloyd Wright: Sechzig Jahre lebendige Architektur; Sixty Years of Living Architecture*. Winterthur and Munich: Verlag Buchdruckerei Winterthur AG, Hermann Rinn, 1952.

"Frank Lloyd Wright: A Selection of Current Work." *Architectural Record* 123 (May 1958): 167–90.

———. *The Disappearing City*. New York: William Farquhar Payson, 1932.

New ed., rev. and enl. *When Democracy Builds*. Chicago: University of Chicago Press, 1945. New ed., rev. and enl. *The Living City*. New York: Horizon Press, 1958. Repr. in Pfeiffer, vol. 3.

Baker Brownell and Frank Lloyd Wright. *Architecture and Modern Life*. New York and London: Harper & Brothers, 1937. Chapters by Wright repr. in Pfeiffer, vol. 3.

Frank Lloyd Wright. *An Organic Architecture: The Architecture of Democracy*, Sir George Watson Lectures of the Sulgrave Manor Board for 1939. London: Lund Humphries, 1939. Repr. in Pfeiffer, vol. 3.

———. *Genius and the Mobocracy*. New York: Duell, Sloan and Pearce, 1949. Repr. in Pfeiffer, vol. 4.

———. *The Natural House*. New York: Horizon Press, 1954. Repr. in Pfeiffer, vol. 5.

———. *A Testament*. New York: Horizon Press, 1957. Repr. in Pfeiffer, vol. 5.

### Wright's Own Writings

A number of collections of Wright's writings exist:

Frederick Gutheim, ed., *Frank Lloyd Wright on Architecture: Selected Writings, 1894–1940*. New York: Duell, Sloan and Pearce, 1941.

Edgar Kaufmann and Ben Raeburn, eds., *Frank Lloyd Wright: Writings and Buildings*. Cleveland and New York: Meridian Books, World Publishing, 1960.

Bruce Brooks Pfeiffer, ed., *Frank Lloyd Wright: Collected Writings*, 5 vols. New York: Rizzoli, Frank Lloyd Wright Foundation, 1992–95. Vol. 1, 1894–1930; vol. 2, 1930–1932; vol. 3, 1931–1939; vol. 4, 1939–1949; vol. 5, 1949–1959.

Perhaps the single most important document of Wright's thoughts on architecture and life in general is:

Frank Lloyd Wright. *An Autobiography*. London, New York, and Toronto: Longmans, Green, 1932. New ed., rev. and enl. New York: Duell, Sloan and Pearce, 1943. New ed., rev. and enl. New York: Horizon Press, 1977. Repr. in Pfeiffer, vols. 2, 4.

Among the other texts that most fully represent the evolution of his thinking are:

Frank Lloyd Wright. "The Art and Craft of the Machine." Orig. pub. Catalogue of the *Fourteenth Annual Exhibition of the Chicago Architectural Club*. 1901, n.p. Repr. in Kaufmann and Raeburn; and Pfeiffer, vol. 1.

———. "In the Cause of Architecture." *Architectural Record* 23 (March 1908): 155–65. Repr. in Gutheim, *In the Cause of Architecture*; and Pfeiffer, vol. 1.

———. Introduction, *Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright*. Berlin: Ernst Wasmuth, 1910[–11], n.p. Repr. in Pfeiffer, vol. 1.

———. *The Japanese Print: An Interpretation*. Orig. pub. 1912. Rpt. New York: Horizon Press, 1967. Repr. in Pfeiffer, vol. 1.

———. "In the Cause of Architecture." Parts 1–5. *Architectural Record* 62 (May, June, August, and October 1927): 394–96, 478–80, 163–66, 318–21, 322–24. Repr. in Gutheim, *In the Cause of Architecture*; and Pfeiffer, vol. 1.

———. "In the Cause of Architecture." Parts 1–9. *Architectural Record* 63 (January, February, April, May, and June 1928): 49–57, 145–51, 350–56, 481–88, 555–61; 64 (July, August, October, and December 1928): 10–16, 98–104, 334–42, 507–14. Repr. in Gutheim, *In the Cause of Architecture*; and Pfeiffer, vol. 1.

———. *Modern Architecture, Being the Kahn Lectures for 1930*. Princeton: Princeton University Press, 1931. Repr. in Frank Lloyd Wright. *The Future of Architecture*. New York: Horizon Press, 1953; and Pfeiffer, vol. 2. A reprint edition of the original text was published by Southern Illinois University Press (Carbondale and Edwardsville, Ill.) in 1987.

### Research Tools and Archival Collections

The definitive bibliography of writings by and about Wright up to 1977 is:

Robert L. Sweeney. *Frank Lloyd Wright: An Annotated Bibliography*. Art and Architecture Bibliographies, no. 5. Los Angeles: Hennessey & Ingalls, 1978.

The most comprehensive guide to Wright's buildings is:

William Allin Storrer. *The Frank Lloyd Wright Companion*. Chicago and London: University of Chicago Press, 1993. This is a much expanded and revised version of *The Architecture of Frank Lloyd Wright: A Complete Catalog*. Orig. pub. 1974. 2d ed., rev. and enl. Cambridge, Mass., and London: MIT Press, 1978.

The voluminous Wright correspondence preserved in the Frank Lloyd Wright Archives at the Frank Lloyd Wright Foundation, Taliesin West, is indexed in:

Anthony Alofsin, ed., *Frank Lloyd Wright: An Index to the Taliesin Correspondence*. 5 vols. New York and London: Garland, 1988.

The many collections containing archival materials on Wright can be found in:

Patrick J. Meehan, ed., *Frank Lloyd Wright: A Research Guide to Archival Sources*. New York and London: Garland, 1983.

The most important collection of original drawings, correspondence, manuscripts, photographs, works of art, and other archival materials is:

Frank Lloyd Wright Archives, Frank Lloyd Wright Foundation, Taliesin West, Scottsdale, Ariz.

Other significant holdings can be found in:

Research Center, Frank Lloyd Wright Home and Studio Foundation. Chicago.

Manuscript Division, Library of Congress, Washington, D.C.: Frank Lloyd Wright Papers, 1894–1940.

University Archives, State University of New York, Buffalo: Frank Lloyd Wright-Darwin D. Martin Papers, MS 22.8; Jaroslav Joseph Polivka. Papers Concerning Frank Lloyd Wright, 1945–1959, MS 48.

Department of Special Collections, Stanford University Libraries. Stanford, Calif.: Frank Lloyd Wright-Darwin D. Martin Papers. MS 355.

Drawings and Archives, Avery Architectural and Fine Arts Library. Columbia University, New York: John Lloyd Wright Collection: Edgar Kaufmann-Fallingwater Collection.

Manuscripts Division, Special Collections, University of Utah Libraries. Salt Lake City: Taylor Woolley Archive, MS 452; Clifford Evans Scrapbooks. MS 466.

Archivo de Arquitectura y Construcción, Escuela de Arquitectura, Universidad de Puerto Rico, San Juan: Henry Klumb Archive.

# F.L. Wright: Precedent, Analysis & Transformation

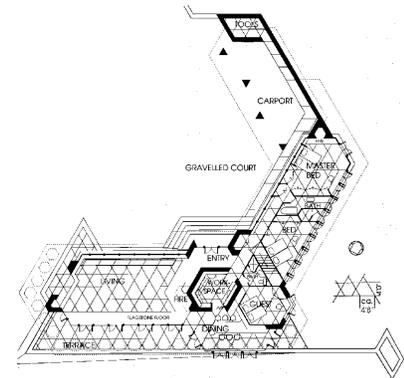
CMU, Arch 48-441 (Project Course)  
Spring 2005, M/W/F 11:30-12:20, CFA 211

Prof. Kai Gutschow  
Email: gutschow@cmu.edu  
Off. Hr: M/F 12:30-1:30pm & by appt. in MM307

11/12/05

## HAGAN HOUSE ANALYSIS - OVERVIEW

In order to thoroughly analyze and understand I.N. & Bernadine Hagan's House on Kentuck Knob in Chalk Hill, PA (1954-56), we will divide the investigation into several subsidiary, inter-related parts. Each student will be responsible for researching and analyzing several aspects of the house and submitting a report summarizing their findings. A short second phase of the project will investigate possible transformations of the design based on our analysis (drafts due Mar. 25 & Apr. 8; final project May 8).



### PART I, HEXAGON:

The hexagonal motif that underlies nearly all aspects of the Hagan House design will be the subject of several lectures in class and separate comparative investigations. In our analysis we seek to understand both how the Hagan House relates to FLW's other diagonal designs, as well as the unique aspects and implications for this house. All students should speculate and seek to find innovative ways to understand, analyze, and highlight the special nature of the Hagan hexagon, especially as it relates to their analysis of the parts.

### PART II, WOODWORK:

Although masonry, flagstones and concrete are clearly important materials in the Hagan House, the class will focus on the impressive woodwork that undoubtedly shapes the most important architectural experiences and design features of the house. Each student will research one of the following three primary components of the woodwork. Work to compare your woodwork with that of earlier FLW houses, particularly of the Prairie and Usonian styles. Speculate on why and in what ways the Hagan House woodwork is both unique and similar to other buildings by FLW.

1. Walls & Structure, construction system of the main exterior & interior walls
2. Furniture, the built-in furniture, & furniture originally approved or designed by FLW, including couch, dining, hallway shelving, bedrooms
3. Ornament, the cutout clerestories, dentils, triangular lights, hexagonal skylights, doors and windows, color/grain/species of wood material

### PART III, FUNCTIONAL SPACES:

All students will study one of the main spaces listed below. Record it in text, sketch, plans, photos, and verbal description. Analyze it in relation to FLW's earlier work, in relation to "ordinary" vernacular architecture, as well as in relation to other contemporary high-design buildings. Particular emphasis should be placed on comparing your space in the Hagan House to similar spaces in the Prairie Houses (esp. Martin) and other Usonian houses (esp. Pope-Leighey). Be sure to focus on the experiential relationship of your space to the rest of the house (i.e. how it fits into the overall plan).

1. Entry & circulation; location in plan, width of halls, flow
2. Kitchen; also called "work room," relation to living, size, role of women
3. Living Room; views, hearth, planters, "community", relation to terrace
4. Dining Room; table & cabinets, relation to kitchen, liv.rm. & terraces
5. Bedrooms & Baths, separate wing, master & children, bath geometry



## PART IV, OTHER ASPECTS

All students will study one of the other important aspects of the Hagan House, documenting the unique aspects of the house with respect to your topic, and comparing it to related work by FLW and other architects at the time.

1. Siting, orientation, landscaping, topography, relationship of interior & exterior
2. Non-Living spaces & structures: roof, foundation, basement, overhangs, planters, carport, terraces
3. Systems: heating, water, ventilation, solar gain, fire places
4. Program & Clients, relationship of architect & client, client satisfaction, program vs. delivered house, living in the house, alterations, etc.

All students should obtain a separate sketchbook/notebook in which all thoughts about the Hagan house can be recorded, assembled, compared and developed.

## BIBLIOGRAPHY:

Hagan, Bernadine. FLW's House for I.N. and Bernadine Hagan (forthcoming, 2005)

Webb, Michael. Modernism Reborn: Mid-Century American Houses (2001), pp.80, 88-93.

Hoffmann, Donald. FLW's Kentuck Knob (2000)

Storrer, William. The FLW Companion (1993), p.405.

Pfeiffer, B.B & Y. Futagawa. FLW Selected Houses vol.7 (1991), pp.162-175

Pfeiffer, B.B. & Y. Futagawa. FLW Monograph, 1951-1959 vol.8 (1988), pp.124-125

Interview Bernadine Hagan, by R. Cleary & R. Taylor, Aug. 15, 1988

National Register Nomination form, prepared by Clinton Piper, 2000:

<http://www.cr.nps.gov/nhl/designations/samples/pa/hagan.pdf>

HABS Photos on-line at Library of Congress: [http://www.loc.gov/rr/print/list/103\\_flw.html#pa](http://www.loc.gov/rr/print/list/103_flw.html#pa)

Restoration As-Built Plans, 1988, in Hunt Library Architectural Archives

Working Drawings, set from Taliesin Archives

Collection of newspaper & magazine articles, including:

"Portfolio of Houses by FLW," House and Home (Sept. 1960): 118-119

Van Trump, J. "Caught in a Hawk's Eye," The Charette (Apr. 1964);  
reprinted in Hagan (2005).

Miller, D. "Visiting the State's other Wright House," Pgh. Post-Gazette (Aug. 4, 1983)

Giron, K. "Kentuck Knob," Tribune Review (Apr. 28, 1996), Focus magazine, p.8-13

Miller, D. "All the Wright Moves," Pgh. Post-Gazette (May 4, 1996) Homes

Beyer, S. "From Cows to Cantilevers: Kentuck Knob and the Kaufmanns," Friends of Fallingwater n.15 (Oct. 1996): 1-6.

Zukowsky, D. "Kentuck Knob Stonework is a Legacy to their Skill," Pgh. Post-Gazette (Apr. 11, 1999), "Arts & Entertainment"

"The I.N. Hagan House-Kentuck Knob," FLW Quarterly 15:4 (Fall 2004): 14-23.



# F.L. Wright: Precedent, Analysis & Transformation

CMU, Arch 48-441 (Project Course)  
Spring 2005, M/W/F 11:30-12:20, CFA 211

Prof. Kai Gutschow  
Email: gutschow@cmu.edu  
Off. Hr: M/F 12:30-1:30pm & by appt. in MM307

11/12/05

## HAGAN HOUSE ANALYSIS – ASSIGNMENT

### 0. READ

McCarter, Robert. "The Integrated Ideal: Ordering Principles in the Arch. of FLW," as well as other essays in FLW: A Primer on Arch'l Principles (1991) as model of exemplary analyses.

### 1. RESEARCH

- A. Find articles (Avery) and books (CAMEO & Worldcat) containing material related to each of your assigned research subjects (see chart below). If CMU does not own, order them via ILL (ASAP). Look in literature about FLW, but also in other sources that will give you comparative examples and material (contemporary architectural magazines, Arch'l Graphics Standards from the time, sources on modern design/houses/furniture/ etc.)
- B. Flip through the most comprehensive books and monograph series on FLW from the list below and pick FIVE (5) FLW or other houses that you would like to compare to the Hagan House with respect to your particular analysis subjects (they can be five different houses for each subject):

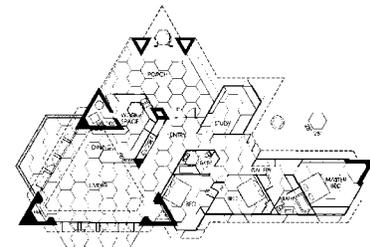
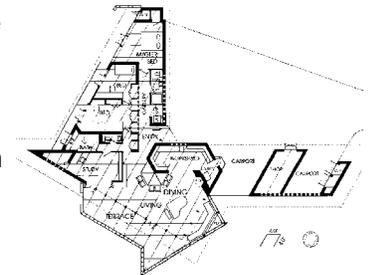
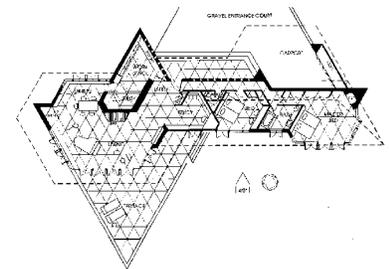
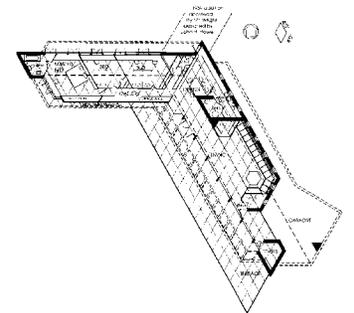
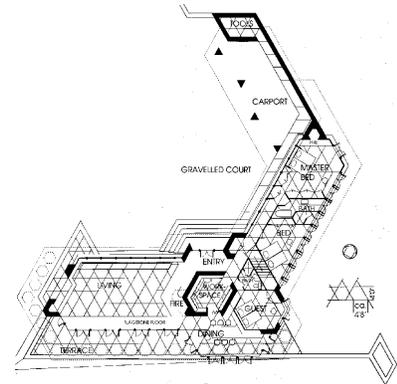
- Storrer, FLW Companion (1993)  
(720.8 W94STAAA in ref. and CD in Music Library)
- Pfeiffer & Futagawa, FLW Monograph, 12 vols. (1984-88)  
(720.8 W94WAAQ in ref.), esp. vol.8
- Pfeiffer & Futagawa, FLW. Selected Houses, 8 vols. (1989-91)  
(720.8 W94WAAS, in ref.), esp. vol. 7
- Sergeant, Usonian Houses
- McCarter, FLW; Levine, The Arch. of FLW; Riley, FLW, Architect

### 2. GRAPHIC ANALYSIS

- A. Compare photographs, plans, sections, and details of the Hagan House with the other houses you have selected. Using your own knowledge about FLW, his sources and design principles, work to find *significant and meaningful similarities and differences*.
- B. Speculate as to WHY FLW or another architect might have made the different or similar design decisions you discover through comparison
- C. Present your findings in a series of 11x17 sheets using photographs, sketches, drafted analyses as well as captions or explanatory paragraphs.

### 3. WRITTEN ANALYSIS

- A. Prepare a 3-5pp. written, text-based summary of your findings on each subject (9-15pp. total). Be aware of how *writing* down the findings of your research and comparative evaluations should bring a different level of awareness about the issues raised in the graphic comparison. Writing and drawing each help clarify thoughts and discoveries in different ways!



#### 4. TEAM ANALYSIS SUBJECT ASSIGNMENTS (see outline above):

II: WOODWORK	III: FUNCTIONAL SPACES	IV: OTHER
Wall/Struct. Will Hopkins Emily Brayton	Entry & Circ. Brian McKinney Kitchen Diego Bauza	Siting Josh Cummings Carole Aspeslagh
Furniture Elizabeth MacWillie Josh Cummings Diego Bauza	Living Elizabeth MacWillie Josh Cummings	Non-living Kevin Wei Will Hopkins
Ornament Kevin Wei Brian McKinney Carole Aspeslagh	Dining Room Carole Aspeslagh Will Hopkins Bed & Bath Kevin Wei	Systems Emily Brayton Brian McKinney Progr./Client Elizabeth MacWillie Diego Bauza

#### 5. SCHEDULE:

- Feb. 25 Lecture on Hagan Hse. and assignment of subjects, Assign Hoffmann & McCarter readings
- Mar. 2 Discuss assignment details, start research
- Mar. 4-13 Spring Break
- Mar. 20 Field Trip to Hagan House & Fallingwater
- Mar. 25 **DUE:** Rough draft of "Graphic Analysis"
- Apr. 8 **DUE:** 2<sup>nd</sup> Draft of "Graphic Analysis and rough draft of "Written Analysis"  
ASSIGN Design transformation sketch project
- May 8 **DUE:** Final report, including Graphic & Written Analysis, and transformation design



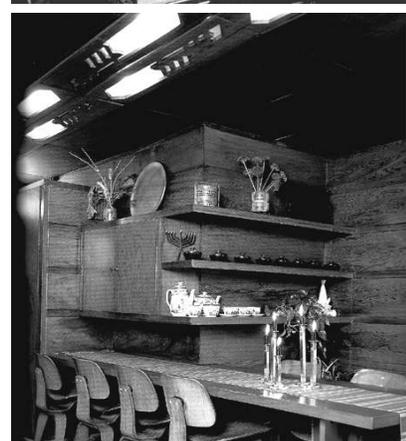
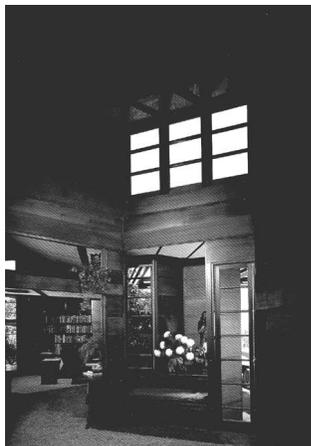
#### 6. BIBLIOGRAPHY (see also books listed in "Overview" above!)

##### GENERAL FORMAL ANALYSIS

- Laseau, P. FLW, Between Principle & Form (1992), E.g. Ch.2, pp.15-25
- Hildebrand, G. The Wright Space (1991)
- Hanks, D.A. The Decorative Designs of FLW (1979)

##### HEXAGON / DIAGONAL

- Hanna, P.&J. FLW's Hanna House (1981)
- Joncas, R. "Pedagogy & Reflex: FLW's Hanna House," JSAH 52 (1993)
- Hersey, G. Monumental Impulse(1999) Ch.4, pp.62-72
- Hamilton, M.J. FLW & Madison (1990) pp.179-88 (Unitarian, Sundt)
- Morosco, G. "Forward," to B. Hagan, Kentuck Knob... (2005)
- Levine, N. "FLW's Diagonal Planning," in H. Searing, In Search of Modern Architecture (1982) pp.245-277 (cf. Levine, FLW Architect, p.497 n. ??)
- De Long, D. Auldbrass: FLW's Southern Plantation (2003), esp. pp.46-89.
- Ramirez, J.A. The Beehive Metaphor (2000), esp. pp.109-114
- Alofsin, A. FLW: the Lost Years 1910-1922 (1993), esp. Ch.9, pp.261-286
- Hoppen, D. "Third Age: Triangle," in The Seven Ages of FLW (1993) pp.58-72
- FLW, The Natural House (1953), esp. "Furniture," etc.
- Sergeant, J. "Woof and Warp," Environment and Planning B 3 (1976): 211-224



# F.L. Wright: Precedent, Analysis & Transformation

CMU, Arch 48-441 (Project Course)  
Spring 2005, M/W/F 11:30-12:20, CFA 211

Prof. Kai Gutschow

Email: gutschow@cmu.edu

Off. Hr: M/F 12:30-1:30pm & by appt. in MM307

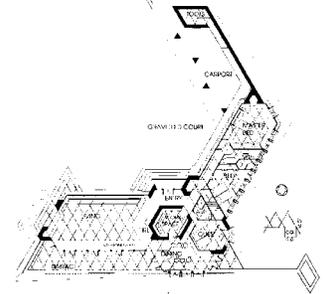
11/12/05

## HAGAN HOUSE ANALYSIS - CONTEXT IN CONTEMPORARY PERIODICALS

**DUE:** Draft Mon. Apr. 18; Final due with overall Analysis, May 8

One of the most productive modes of analysis, indeed of all understanding, is through COMPARISON to a VARIETY of CONTEXTS. The original Hagan House Analysis Assignment urged you to explore at least five other houses in relation to your Kentuck Knob analysis topics, either other houses by FLW, or contemporary houses.

In order to promote more intense investigation of the contemporary architectural scene as a means to understanding Kentuck Knob, every student will be asked to search through one professional architectural periodical and one domestic home magazine from 1953-1956 to find specific comparative images. Find AT LEAST 20 images related to your particular analysis topics in EACH journal you sign up for. Scan images, save on a disk, and print out on 8.5"x11" or 11"x17" pages, with title and brief caption & source for each image. For EXTRA CREDIT, search through a foreign architectural magazine and/or bring back images related to other analysis topics of your peers.



Be sure to look at feature articles, notes, and advertisements. Try to get a feel for the color schemes, the fashion, style and mood of the era. What are the dominant themes? What are the dominant companies? Who is the target audience? What is the "ideal" house represented in the magazine? What is the role of women? What is the approach to machines? How is wood shown and used in architecture? What kind of ornament is depicted?

### DOMESTIC HOME MAGAZINES

House and Garden (New York, 1901-1977)

House Beautiful (New York, 1951-1975)

(NOT v.97, Oct.-Dec. 1955)

House and Home (New York, 1953-1977)

Arts & Architecture (Los Angeles, 1945-1966)

### EXTRA CREDIT

Domus (Milan, 1950ff.)

Werk (Bern, 1947-1976)

Shinkenchiku / Japan Architect (1955-pres.)

L'Architecture d'aujourd'hui (Boulogne, 1953-pres.)

Bauen & Wohnen (Munich, 1952)

### PROFESSIONAL ARCHITECTURE JOURNALS

Architectural Forum (New York, 1917-1974)

Progressive Architecture (New York, 1946-1995)

Journal of the A.I.A. (Washington, 1944-1957)

Architectural Review (London, -present)

### ANALYSIS TOPICS

Woodwork: Walls/Structure, Ornament, Furniture

Function: Entry, Kitchen, LR, DR, Bed/Bath

Other: Site, Non-living, Systems, Client/Program

**A small kitchen needn't be inconvenient!**

Just see how skillful planning transformed a scant 10'x11' area into a beautiful kitchen of smooth, work-saving convenience! The secret—generous work surfaces and a place for everything handily near where it's first used, thanks to Republic Steel Kitchens. And who wouldn't treasure that "kissed"? It serves as dining bar, window work counter, storage area...and deftly discourages cross-kitchen traffic.

**REPUBLIC STEEL Kitchens**

**Small kitchen—big possibilities!**—with built-in, built-in units that do the job again and again and save the kitchen floor. Republic's built-in units are built in, built in, built in. They're built in, built in, built in. They're built in, built in, built in. They're built in, built in, built in.

**Small kitchen—big possibilities!**—with built-in, built-in units that do the job again and again and save the kitchen floor. Republic's built-in units are built in, built in, built in. They're built in, built in, built in. They're built in, built in, built in. They're built in, built in, built in.

**Small kitchen—big possibilities!**—with built-in, built-in units that do the job again and again and save the kitchen floor. Republic's built-in units are built in, built in, built in. They're built in, built in, built in. They're built in, built in, built in. They're built in, built in, built in.

Usable wall space in living room totals 370", a big asset to furniture arrangement and a rarity in small houses today. This seating group is backed by triple windows draped floor to ceiling in a price and customer mesh.

Left: View from front door. Long run of floor space is increased by dining L, whose actual distance, diagonally from fireplace corner, is 32". This allows for two oversized seating groups, plus a desk area.

Seven 30" oval ottomans placed together to form sofa forms a flexible seating arrangement. We liked idea of two distinct groupings and could manage it on a budget, because we used foam rubber cushioned ottomans.

House Beautiful's Decorating Staff furnished this 7-room house on a total budget of \$6,000 for everything except the outdoor terrace furniture. All draperies and bedspreads are ready-made. All merchandise can be bought in fall offerings of stores

Please turn the page

The famous "Falling Water" house, world's most publicized residence, designed by Frank Lloyd Wright, is equipped with

**THRUSH Hot Water Heat**

In the nation's finest homes you find hot water heat, Thrush controlled. HOT WATER HEAT is the simplest, cleanest and most uniform heating possible for your home. There are no noisy fans, no blowing dust...no hot, then cold feeling. Thrush Radiant Hot Water System provides constant radiant warmth without any noticeable temperature variation. It is completely automatic. Pipe coils hidden in the ceiling or floor or radiant baseboards use no floor space. The same heating boiler provides plenty of hot water for kitchen, laundry and bath the whole year through. It's just like living in a mild climate all winter long no matter what the weather outside may be. With modern Thrush equipment, installation cost is low and maintenance is negligible. It reduces fuel consumption, and operating costs are amazingly inexpensive.

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# F.L. Wright: Precedent, Analysis & Transformation

CMU, Arch 48-441 (Project Course)  
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11/12/05

## HAGAN HOUSE ANALYSIS: TRANSFORMATION

**DUE:** with overall Analysis, May 8

"Do not try to teach design. Teach principles." FLW, 1936.

"I hope [my] buildings. . . illustrate basic principles which give to them all such vitality, integrity, and magic as they have. I still hope to see these basic principles more comprehended, therefore the effects imitated less. No man's work need resemble mine. If he understands the working of the principles behind the effects he sees [in my buildings], with similar integrity he will have his own way of building." - FLW 1951.

"I am convinced that the pattern made by a cross section of a honeycomb has more fertility and flexibility where human movement is concerned than the square. The obtuse angle is more suited to human to and fro than the right angle. Flow and movement is, in this design, a characteristic lending itself admirably to life, as life is to be lived in it." - FLW 1938.

"Remember the impression one gets from good architecture, that it expresses a thought. It makes one want to respond with a gesture." - Ludwig Wittgenstein.

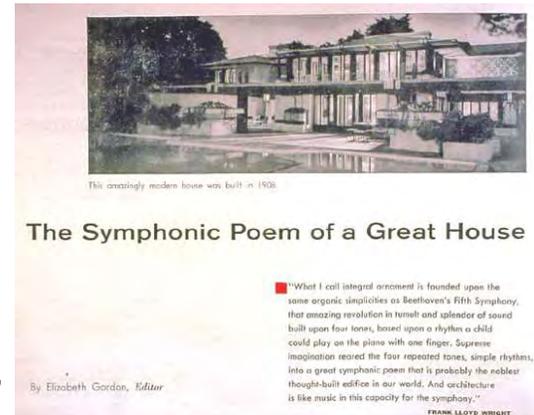
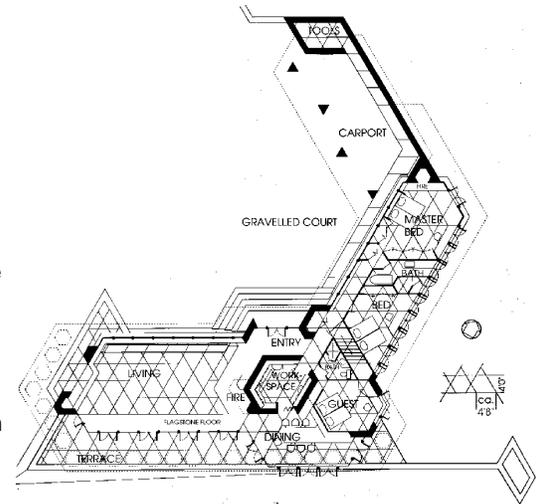
Inspired by the quotes above, and using all the knowledge, experience, and intuition about FLW buildings and Kentuck Knob in particular that you have gathered over the course of the semester, "respond" to the Hagan House by designing a small addition, remodeling, or additional element for some part of the house. Your design can either "blend in" and "resemble" Wright's aesthetic, OR it can be based on the "principles" that he espoused, including "vitality, integrity, and magic." Consider also the hexagonal "unit system" that is at the core of the entire Hagan House, and the idea of architecture as a "symphonic poem." Your design can be "retro" for 1953, or "contemporary" for 2005. You can use any appropriate material, as long as it conforms to Wright's principles.

Your design should be communicated through a series of sketches on a 8.5"x11" or 11"x17" page to be appended to your Hagan House Analysis. To accompany and justify your design as fitting the Hagan House, you should compose a 100 word "concept statement" or explanation of principles.

Examples of the items you might design are taken from the list of items that Mrs. Hagan took with her when she left in 1986, or for features that might need to be renovated or updated over time:

- Dining Room Chair
- Living Room Chair (wood or upholstered)
- Coffee Table
- End Table
- Chest for Entry
- Wood Screen
- New Rug
- Exterior Planter
- Kitchen Skylight
- Improved Toolshed
- Entry Sign for Kentuck Knob
- Ticket Booth for estate
- Interpretive Sculpture or Design-Build Element
- ?

The list is not complete, meant more to illustrate a scale and complexity. You are free to choose any element you wish, or to compose an interpretative art work or design of any kind.



## COMPARISON BUILDINGS for KENTUCK KNOB

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### HEXAGONS & 30/60°

Bay Windows on early homes  
Martin House, Buffalo, NY, 1904 (windows)  
Midway Gardens, Chicago, IL, 1914 (decoration)  
Imperial Hotel, Tokyo, 1915-1923 (esp. furniture & decorative work)  
Bogk House, Milwaukee, WI, 1916-17 (decoration)  
A.M. Johnson Desert Compound, Death Valley, CA, 1922-25 (project)  
Nakoma Country Club, Madison, WI, 1923-24 (project)  
Kindergarten & Playhouse for Barnsdall, Los Angeles, 1923 (project)  
Doheney Ranch, Los Angeles, 1923 (project)  
Lake Tahoe Summer Resort, CA, 1922-1924 (project)  
Freeman House, Los Angeles, 1923-1924 (concrete block pattern)  
Taliesin III Apprentice Quarters & Chicken Coops, 1925  
San Marcos in Desert Resort, Chandler, AZ, 1928-1929 (project)  
Cudney House, Chandler, AZ 1929 (project)  
Steel Cathedral, NYC, 1926 (project)  
St. Marks Towers, NYC, 1927-31 (project)  
Ocatilla Camp, AZ, 1928  
Taliesin Drafting Studio, 1932 (hearth & structure)  
Wiley House, Minneapolis, MI, 1933 (terrace)  
Fallingwater, 1935-38 (30/60° used to lay out plans)  
Kaufmann Office, Pittsburgh, 1937  
Hannah House, Stanford, CA, 1936  
Herbert Johnson House, Racine, WI, 1937 (playroom)  
Manson House, Wausau, WI, 1938  
Florida Southern College, Lakeland, FL, 1938ff.  
(Pfeiffer Chapel, Roux Library, Minor Chapel)  
Sidney Bazett House, Hillsborough, CA, 1939  
Armstrong House, Gary, IN, 1939  
Auldbrass Plantation, Yemassee, SC, 1938  
Stevens House, Yemassee, SC, 1940  
Community Church, Kansas City, MO, 1940  
Wall Residence, Plymouth, MI, 1941  
Richardson house, Glen Ridge, NJ, 1940  
Nesbitt House, Carmel, CA, 1941 (project)  
Sundt House, Madison, WI, 1941 (project)  
Guggenheim project, NYC, 1944  
Friedman Vacation Lodge, Pecos, NM, 1945  
Unitarian Church, Madison, WI, 1947  
McCartney Residence, Parkwyn Village, Kalamazoo, MI, 1949  
Hughes House, Jackson, MS, 1948  
Lamberson House, Oskaloosa, IO, 1948  
Walker Residence, Carmel, CA, 1948  
Anthony House, Benton Harbor, MI, 1949  
Reisley House, Pleasantville, NY, 1951  
Davis House, Marion, IN, 1950  
Berger House, San Anselmo, CA, 1950  
Mathews House, Atherton, CA, 1950  
Palmer House, Ann Arbor, MI, 1950  
Smith House, Jefferson, WI, 1950

Gillin, House, Dallas, TX, 1950  
Kraus Residence, Kirkwood, MO, 1951  
Glore Residence, Lake Forest, IL, 1951  
Kinney House, Lancaster, WI, 1951  
Rubin House, Canton, OH, 1951  
Edgar Kaufmann Chapel, Mill Run, PA, 1951-52 (project)  
Chahroudi Cottage, Lake Mahopac, NY, 1951  
Teater Studio, Bliss, ID, 1952  
Price Tower, Bartlesville, OK, 1952  
Andreton Court Shops, Beverly Hills, CA, 1952  
Point View Residence, Pittsburgh, 1952-53 (project)  
Boomer Residence, Phoenix, AZ, 1953  
Cooke House, Virginia Beach, VA, 1953  
Dobkins, Residence, Canton, OH, 1953  
Beth Shalom, Synagogue, Elkins, Park, PA, 1954  
Arnold House, Columbus, WI, 1954  
**Hagan House, Chalkhill, PA, 1954**  
Thaxton House, Bunker Hill, TX, 1954  
Fawcett House, Los Banos, CA, 1955  
Heritage-Herrredon Furniture Line, 1955  
Friedman House, Bannockburn, IL, 1956  
Arizona State Capitol, Phoenix, 1957 (project)  
Olfelt House, St. Louis Park, MN, 1958  
Albin House, Bakersfield, CA, 1958  
Stromquist House, Bountiful, UT, 1958  
Pilgrim Congregational Church, Redding, CA, 1958

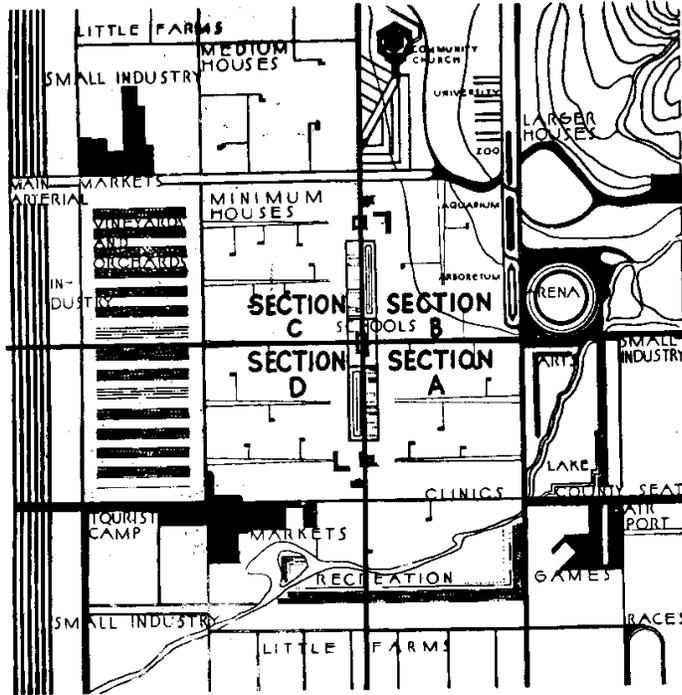
### OCTOGONS & 45°:

FLW Home & Office, Oak Park, IL. 1898  
Bagley House Library, Hinsdale, IL 1894  
Chauncey Williams House, River Forest, IL 1895  
Romeo & Juliet Windmill, Taliesin, 1896  
Furbeck House, Oak Park, 1897  
River Forest Golf Club, 1898  
Husser House, Chicago, IL, 1899  
Willits House, Highland Park, IL 1901 (ceiling, prow)  
Glasner Residence, Glencoe, IL 1905  
Robie House, Chicago, IL, 1909 (prow)  
Beach Cottages, Dumyat, Egypt, 1927  
T-West, Scottsdale, AZ, 1937  
Guggenheim Scheme, NYC, 1944 (project)  
Walter house, Quaqueton, IO, 1945  
Elam House, Austin, MI, 1950  
Lindholm Service Station, Cloquet, MI, 1956

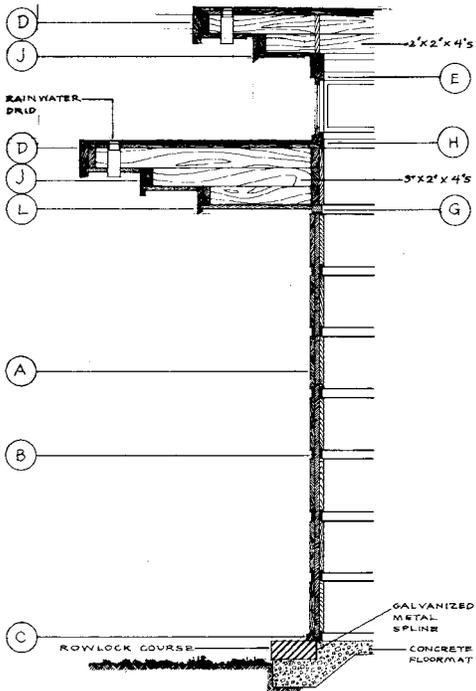
### OTHER

Fallingwater, 1935-38 (30/60° used to lay out plans)  
Usonian Model House, "60 Years of Living Architecture" Exhibit, Guggenheim Site  
Notz House, Briery/Berndtson  
Douglas House, Ross, PA, P. Berndtson, 1962

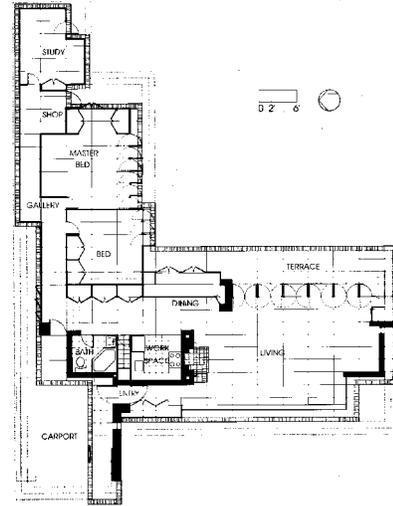
BROADACRE & SQUARE USONIANS



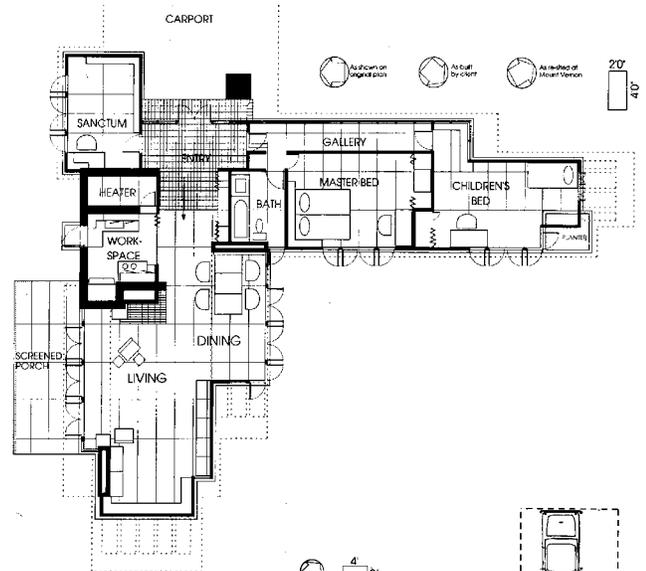
Broadacre City, 1935



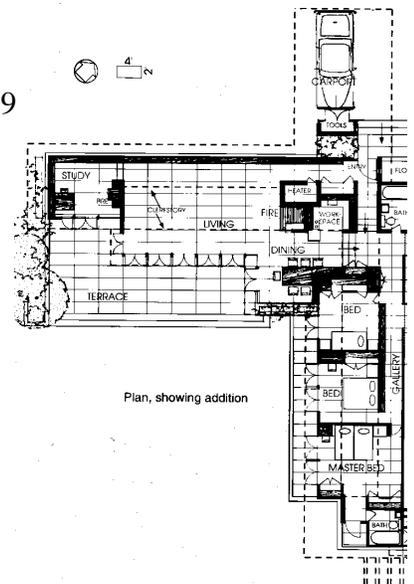
Typical Usonian Wall Section



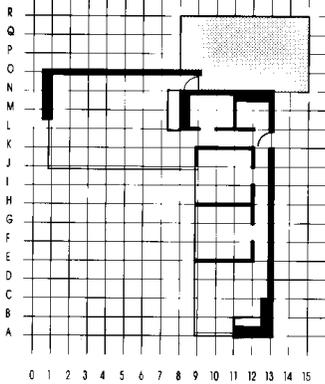
Jacobs 1936



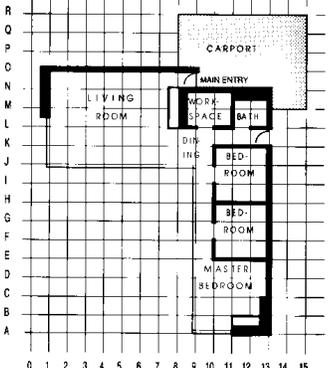
Pope-Leihey, 1939



Rosenbaum, 1939



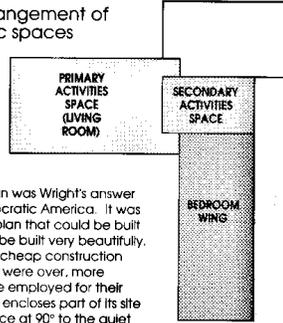
Basic (90°) L plan (with back gallery)



Spaces of an L plan with gallery at inside of L (front gallery)

Tripartite arrangement of domestic spaces

### BASICS OF THE L-PLAN USONIAN HOUSE



The L-plan Usonian design was Wright's answer to the dilemma of Democratic America. It was a compact single-story plan that could be built cheaply, but could also be built very beautifully. The Depression required cheap construction but, once it and the war were over, more expensive materials were employed for their beauty. The basic L plan encloses part of its site by placing the living space at 90° to the quiet space.

The basic design principle that brought about the Usonian house is the same as that which Wright had established early in his career. The prime activities space, the living room, dominates the design, but even more so here than in his Prairie works. Secondary activities, the workspace (kitchen) in particular, are allotted minimal space, and the bedrooms, upstairs in early work and Prairie designs, are brought to ground level.

The drawings presented here are simplified, to make design principles all the more obvious.

In the plan at the upper left, similar to the first L-plan Usonian, the Jacobs First Residence (S.234), the main entry leads directly only to the living room, without forks to each of the other activities areas, as was the norm in all Wright's designs. Wright allowed this simplification in his least expensive Usonian designs, though a secondary entrance would lead to these areas and actually provide a common center for pedestrian traffic.

The living room of a Usonian home is its largest space. From the workspace, small enough to do all the work by turning, rather than walking, the housewife has a view down the gallery, and can be in the dining or living areas quickly.

Usually there is a fireplace in both the living room and master bedroom, as well as any additional guest bedroom. The utilities space may be at level or located below ground. More than this, details are not shown, for it is space, and how it is organically organized for human habitation, that is our prime concern.

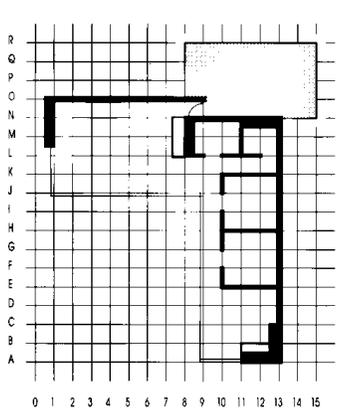
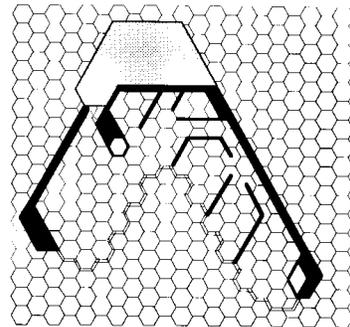
In the drawings of Usonian structures here and following, thinnest lines other than the grid lines represent walls, floor to ceiling (or soffit) doors or windows; are room partitions, usually of sandwich wall construction. Thick walls are exterior walls, perhaps with transoms or windows. Thick blocks are the masonry masses from which the roofs are cantilevered.

The attempt has been made throughout the Usonian drawings to keep each specific space the same size whatever the unit module or configuration, though the nature of organic design precludes this being made in absolute condition. Throughout all variations, standard elements are kept as regular as is practical, so that underlying design principles may be most easily observed.

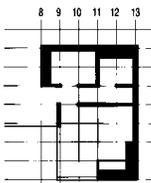
Creative detailing, so much a part of Wright's genius, is beyond the scope of these demonstrations of Usonian possibilities. How a simple 90° L can be turned into plans at other angles, or how it can be curved, and how the slight alteration of one area can affect the entire spatial composition is the creative aspect dealt with here.

If a basic 4' dimension is applied to the unit module for each of the Usonian drawings here and following, each module (except some circular segments) would be 16 square feet yielding in the basic Usonian L plan on the previous page 1552 sq. ft. and in the Hex below, 1568.

60° Hexagonal plan (Inside L plan set on hexagonal module)

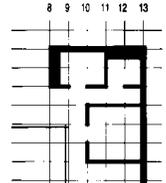
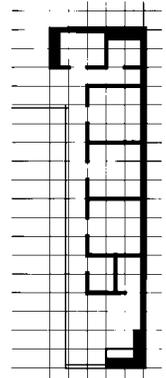


3 bedrooms, 1 bath, a fairly common Usonian arrangement



1 bedroom, 1 bath

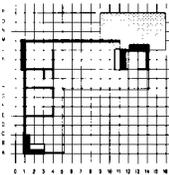
4 bedrooms, 3 baths



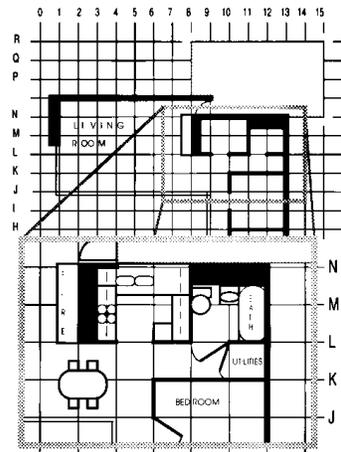
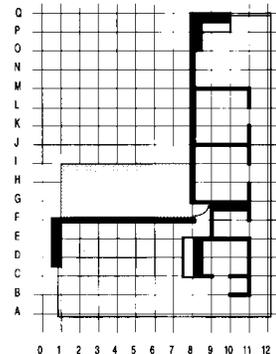
2 bedrooms, 1 bath

The Usonian L-plan type house is capable of infinite variety. Wright started with an inside (90°) L, then developed an in-line (180°) version of the Usonian house. Further extension to 270° gives an "outside" version of the L. The Prime Activity and Quiet spaces meet at the Workspace, keeping the tripartite arrangement of spaces intact. Wright would, however, try most any possibility; move the bedroom wing to the other side of the living room for instance, even though this plays havoc with tripartite spatial arrangement.

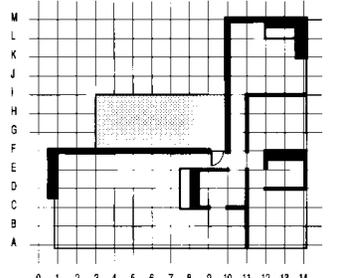
Inside L, Opposed wing variant of the standard L-plan Usonian house (half size)



Outside (270°) L plan, front gallery



Workspace blow-up



Outside (270°) L plan (wing offset), with back gallery

### USONIAN BASICS (2)

USONIAN homes can be built for any size family. The bedroom wing is extended with as many bedrooms as needed for the children, and terminated by the master bedroom. If the family should grow beyond expectations, the wing can be extended. The wall between pairs of rooms can be removed, and bunk beds installed, as another way to accommodate a large family. Yet another arrangement of bedrooms, the cluster plan, is shown with in-line plan variations.

## USONIAN ANALYSIS

- Sergeant, John. FLW's Usonian Houses  
 Jacobs, Herbert. Building with FLW  
 Morton, Terry. The Pope-Keihey House  
 P. & S. Hanna. FLW's Hanna House  
 De Long, David. Auldbrass.  
 Reisely, Roland Usonia, New York  
 Rosenbaum, Alvin. Usonia. FLW's Designs...

- McCarter, Robert. FLW, Ch. 9  
 MacKenzie, Archie. "Rewriting the Natural House," in  
 McCarter, A Primer on Arch'l Principles  
 Burns, John. "Usonian Houses," in Yesterday's Houses...  
 Handlin, David. The Modern Home  
 Wright, Gwendolyn. Building the Dream

### USONIAN VOCABULARY

Interior spaces of a (standard) Usonian (90°) L-plan house. Wright's domestic ideal in its most compact expression. This is a "back gallery" plan, which fact needs no stating, as it is the norm. If the gallery were between bedrooms and the enclosed yard space, it would be described as a "front gallery" plan. The 90°, or "inside," L plan was Wright's standard. Therefore can be described simply as "Usonian L." Such a plan is based upon the square/rectangle unit-module as the basis of its grid. As to other modules, such as the equilateral — triangle and parallelogram (diamond) — and the hexagon, each has its own version of this basic format.

**Left-handed L**      **Right-handed L**

**In-line (or 180°) plan, Left-handed**

**In-line plan, Right-handed**

**Outside (or 270°) L, right-handed, plan ("Outside," because the view is "outside" the angle enclosed by the L)**

The equilateral parallelogram and equilateral triangle modules create their own set of types. Due to the nature of the 60° angle, two "inside" types are possible, at 60° and 120°. The 60° plan may therefore be usefully categorized as a "closed," the 120° as an "open," L (cf. the hexagonal-moduled Bassett house, S.259).

Quite often, houses opened their views out the end, rather than directly into the private area, creating such interesting variants as "end" in-line, or T, plans.

Once Wright saw that the Prairie cruciform/pinwheel design was more suited to wealthy clients than to the needs of the average American, he looked for a perfect statement of his principle of design that would be applicable to all levels of American society. The result of his search was the Usonian principle. In this, the prime space dominated the structure, and all other elements were reduced to their minimum practical expression. Thus, the living room remains a domestic constant, while all other spaces were shrunk, either absolutely, or in proportion to the living room.

**Closed (60°) L plan**      **Open (120°) L plan**

**Outside (240°) L plan**      **(True) In-line plan on 60°-120° module**

The Outside L is right-handed, the other three left.

**L plan cantilevers**

These L-plan cantilevers are based on a three bedroom L plan with back gallery.

The living room wing roof is cantilevered from masonry masses A and B. The overhang is pierced in squares 2/3 the module.

The bedroom wing roof is cantilevered primarily from masonry masses C and E with additional anchoring provided by B and D.

**THE USONIAN CANTILEVER**

By employing the cantilever, we create glass walls where once the view had been shut out from the outdoors. This changes the view into a home open to life.

### THE EQUILATERAL PARALLELOGRAM MODULE

Two L-plan Usonian designs were on the Taliesin drafting boards at the same time, the first Jacobs, S.234, and the Hanna, S.235. Original drawings show the Jacobs to have first been done on a 2' square, later redrawn to a 2x4' rectangle, while the Hanna was done on a hexagon with 26' side (45° altitude).

The hexagonal unit is time-consuming to draw while the equilateral parallelogram of 60° and 120° is simple and can accommodate anything that would otherwise require the hex. This module is popularly called a "diamond," and is easily drawn with the 30-60° triangle.

120° plans on the equilateral parallelogram module should be called on "open," as opposed to a "closed" 60°, L, and the 240° plans would equate to the 270°, or outside, L. Plans employing interlocked grids of square units would be open Ls at 135° and Outside Ls at 225°. A 45° closed L is possible, but hardly practical.

Double 120° plan, front gallery. This variation gains two additional rooms, each with private bath, over standard 120° plan.

The 135° plan was experimented with sparingly by Wright, for he quickly discovered the delights of the 120° plan on the equilateral parallelogram module.

**Standard (single-wing) 120° plan, front gallery.**

Note the variation shown for the carport which, of course, could be located as in the double 120°. This calls for a single entry and fireplace in its usual place, back-to-back with the workspace. It would also require an additional support for the carport cantilever.

### THE 30-60° PLAN

(270° L, back gallery plan, main spaces conformed to 30-60 triangle, on equilateral parallelogram module)

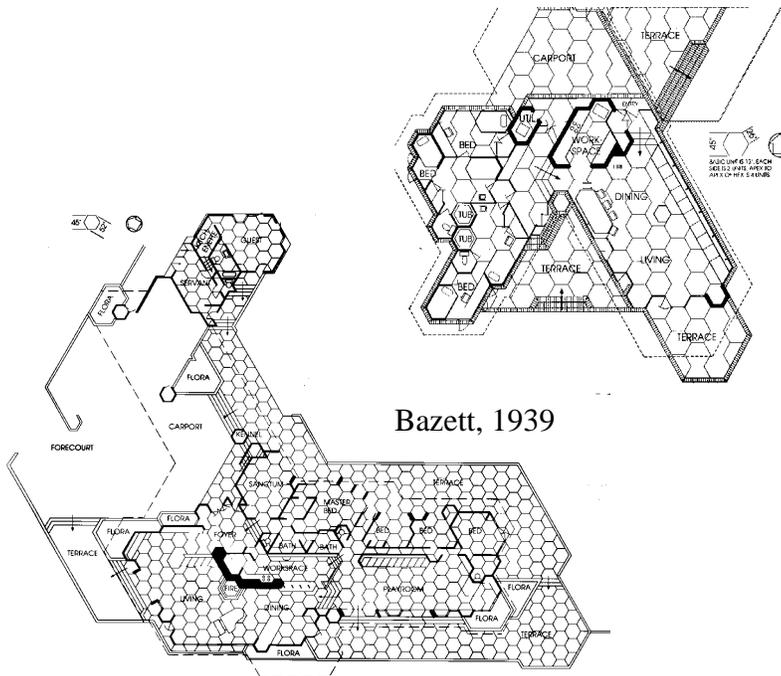
That Wright enjoyed his T-square and triangles is key to many of his most creative designs. Take two 30-60 triangles, resting their short edge of the smaller on the hypotenuse of the other, such that the two hypotenuses form a 120° angle. The two plans shown here follow this approach to design. Compare the 30-60 Outside L plan with master bedroom in the main wing, below, to the McCartney second stage design, S.299A.

**30-60 Outside L plan**  
Master bedroom in main unit

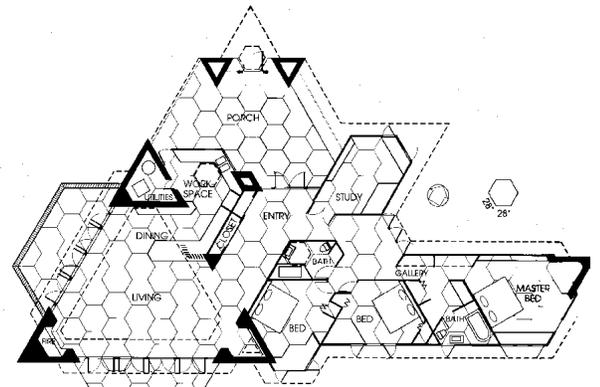
Wright's original idea for the 30-60° triangle utilized a single triangle only, as a "one-room" cottage, for "Margaret Wright Barney, the sister. One possibility which could be developed into a larger building, by addition of a wing beyond the bath room, is shown below. The Anthony house, S.315, has the master bedroom in the main unit, as below or at right. Its bedroom is laid out on an inverted grid, so does not conform to the 30-60° idea.

"One-room cottage" from 30-60° triangle (half size)

HEXAGONAL USONIANS

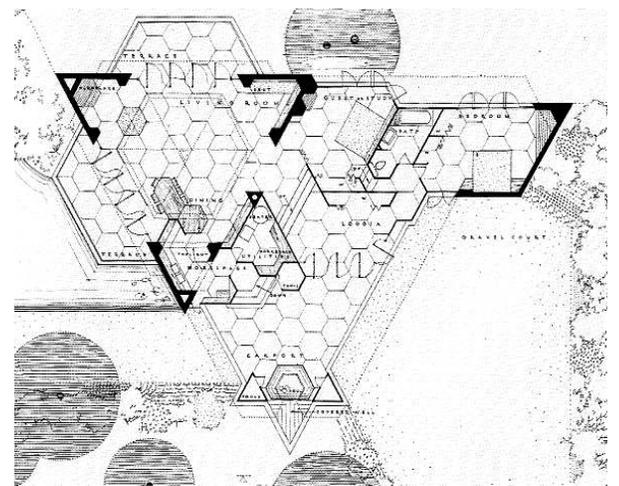


Bazett, 1939

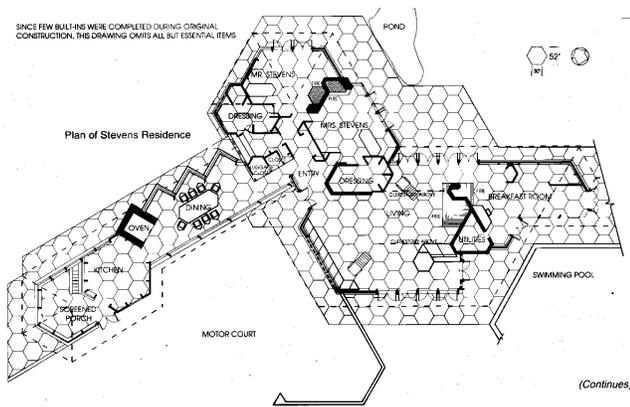


Richardson, 1940

Hanna, 1936



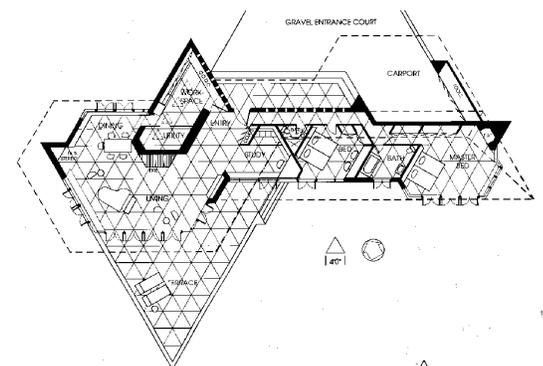
Sundt, 1941



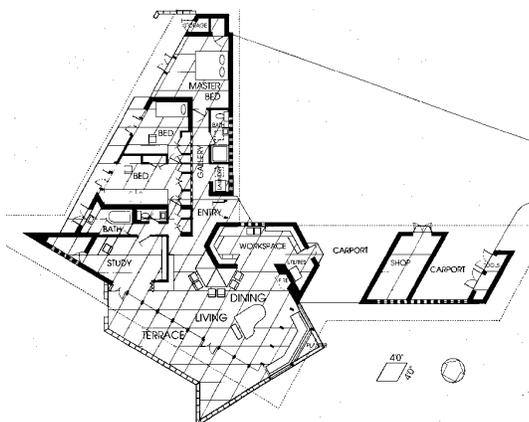
Auldbrass / Stevens, 1939

(Continues)

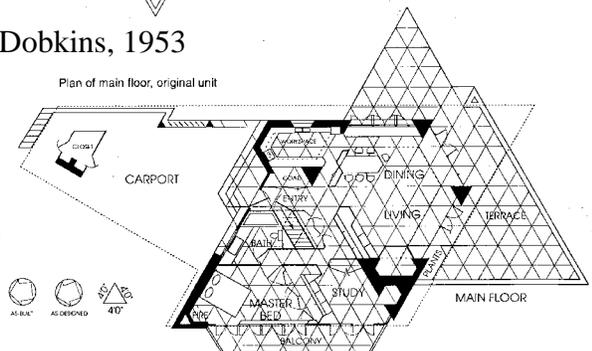
269



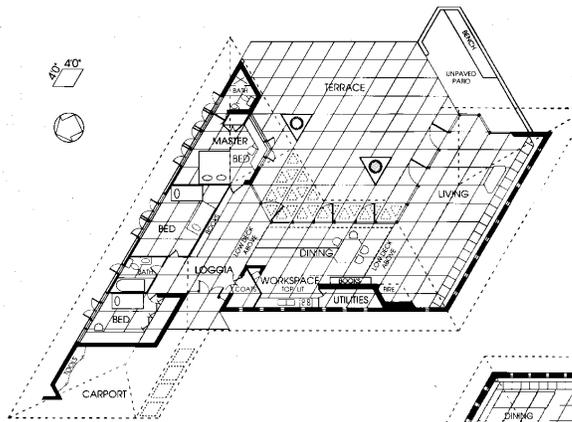
Dobkins, 1953



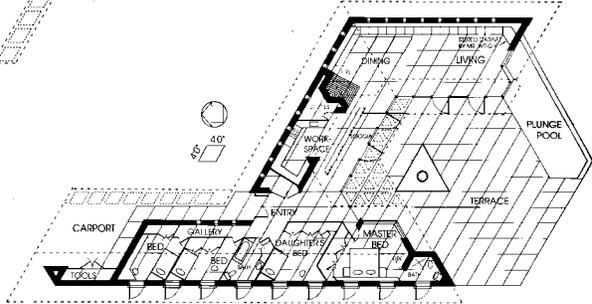
McCartney, 1949



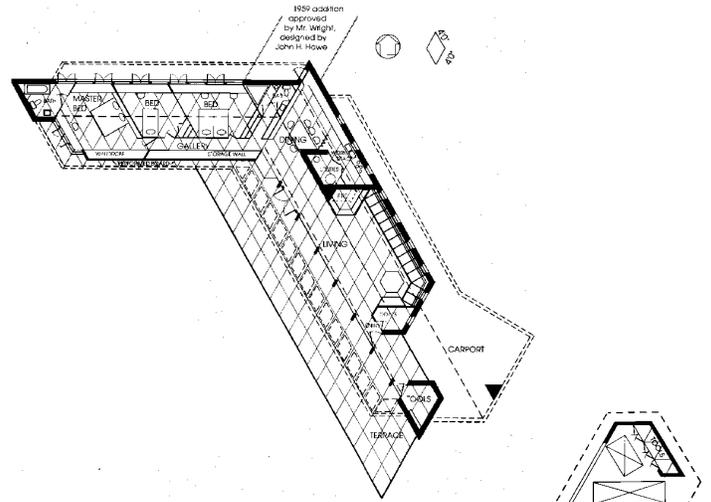
Reisley, 1951



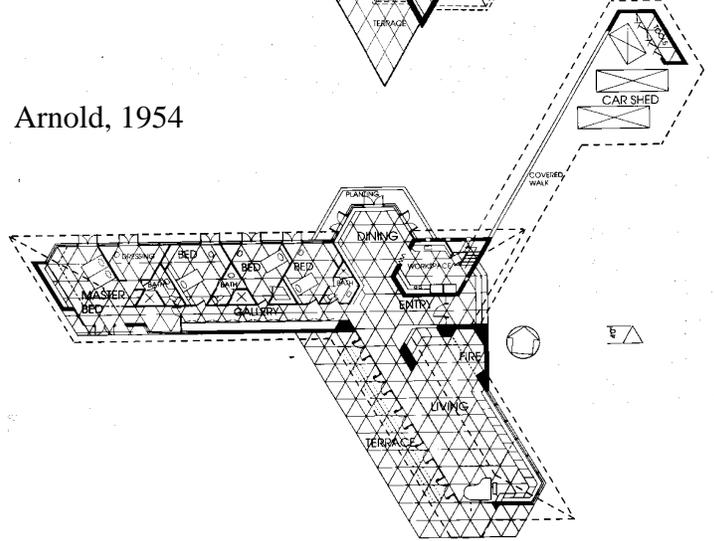
Mathews  
1950



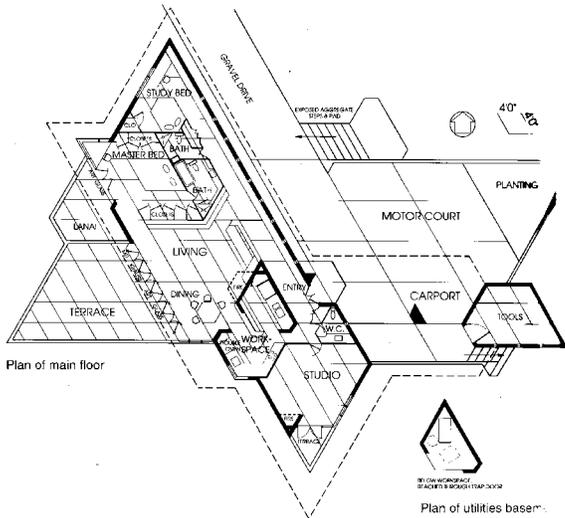
Smith, 1950



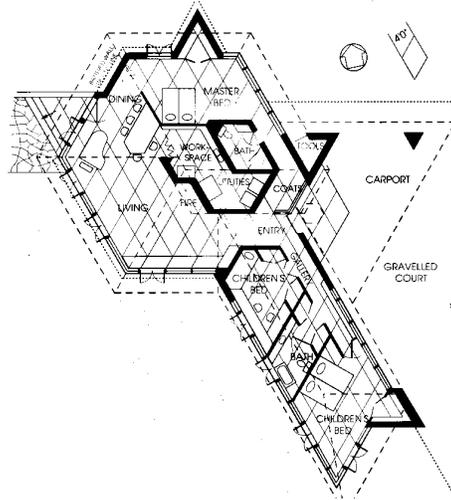
Arnold, 1954



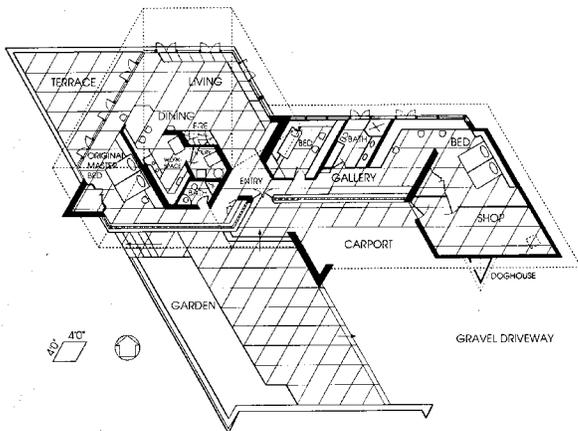
Friedman, 1955



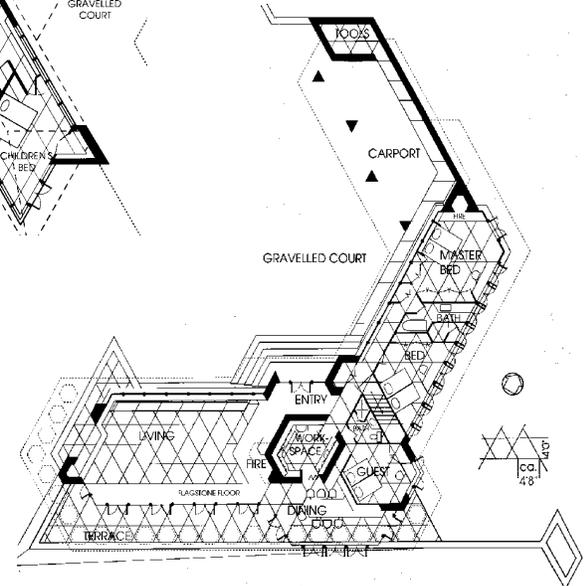
Kraus, 1951



Kinney, 1951



Berger, 1950



Hagan, 1954

# Frank Lloyd Wright's Kentuck Knob

Architectural Restoration and Conservation (ARC)  
of Carved-Wood Interiors

Friday 15 April, 2005,

Carnegie Mellon University  
School of Architecture

201 College of Fine Arts, 9:30-5:00

Kai Gutschow, Assistant Professor  
Charles Rosenblum, Adjunct Assistant Professor  
Laura Lee, Associate Professor, Head

## Introduction:

Wood  
Proximity  
Integrated Design  
Total Work of Art  
Hexagon  
Modern  
FLW  
Reproduction  
Architectural History  
Teaching



# Fallingwater

Edgar Kaufmann



## Southwestern Pennsylvania



Uniontown  
Bear Run

## Aerial Views

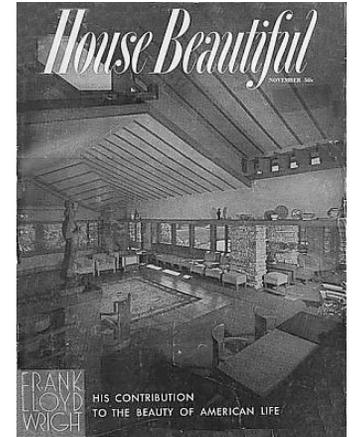
Chalk Hill  
Ohio



## Educating the Hagans

Edgar Kaufmann, jr

*What Is Modern Interior Design?*



## Taliesin

Spring Green,  
Wisconsin  
1911-25

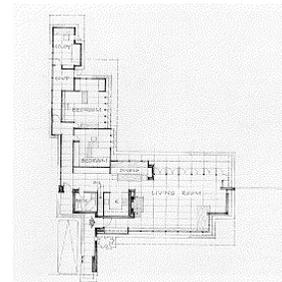


Hagans visit  
August 1953

## Jacobs House

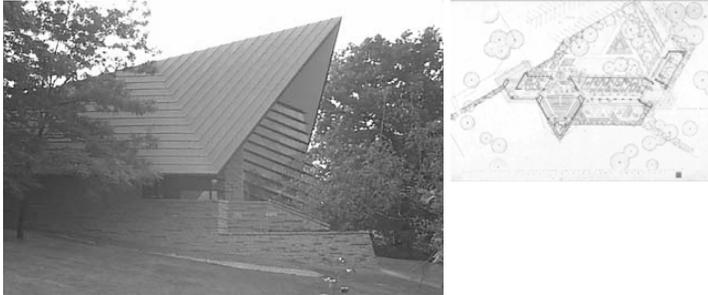
Madison Wisconsin, 1936

The first Usonian House



# Unitarian Meeting House

Madison, Wisconsin  
1947-1950

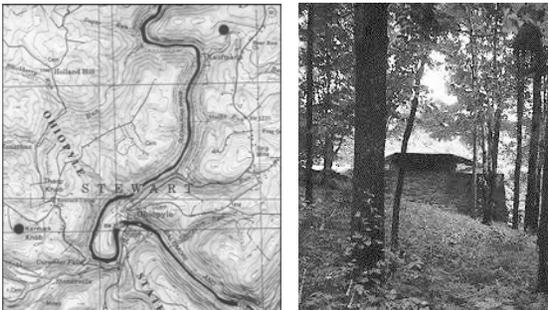


# Guggenheim Usonian

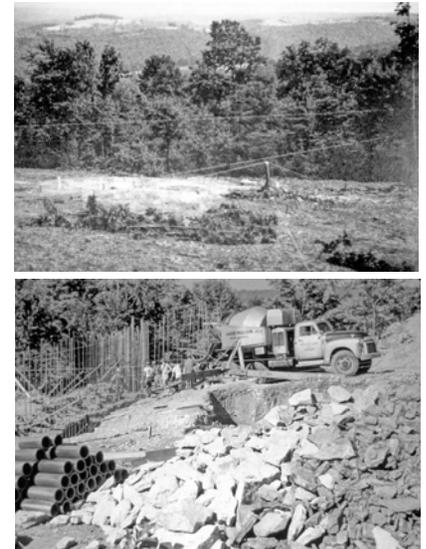
New York, New York  
1951 (Temporary Exhibition)



# Hagan Site

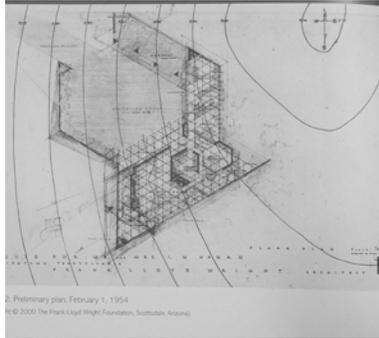
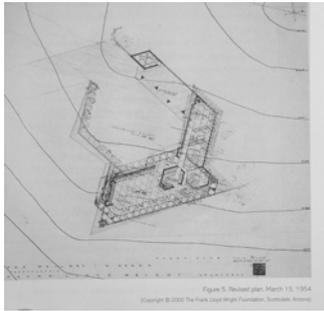


# Site Preparation

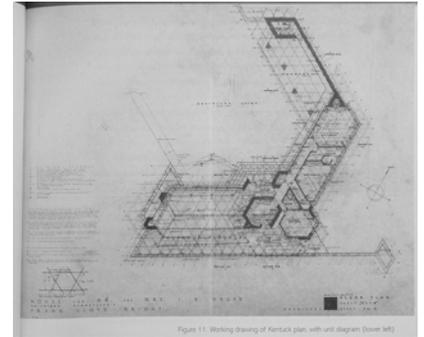


Stone  
Trees  
Geometry

## Plan Development

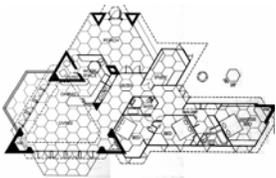


## Plan Development



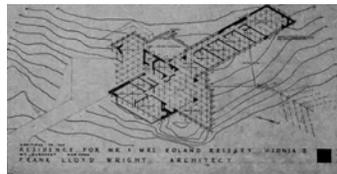
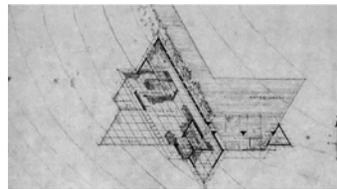
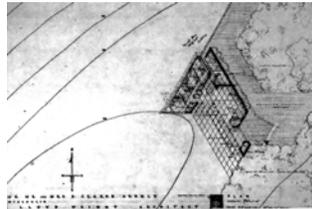
Hexagonal Driveway

## Usonian Plans



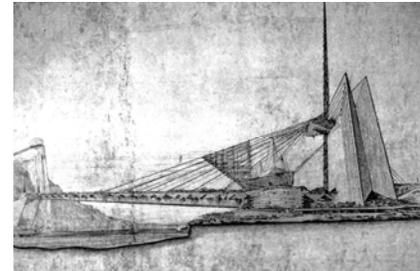
Sundt  
Bazett

Arnold  
Kraus  
Reisley



## Wright Pittsburgh Projects

The Point  
Mt. Washington



## Approach



Horizontal  
Copper Roof  
Stone  
Enclosed

## Details



Joinery  
Clerestory cutouts  
Dentils  
Signature tile



## Entry and Living Room



with original furniture

## Couch



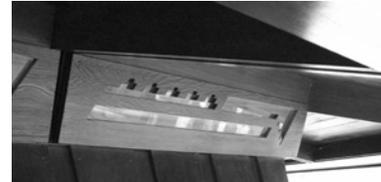
Seating for 15

## Cut-outs: Pope-Leighey



Alexandria, Virginia  
1939-40

## Cut-outs: Auldbrass



## Living Room Section



Construction: stone and wood

## Stone...

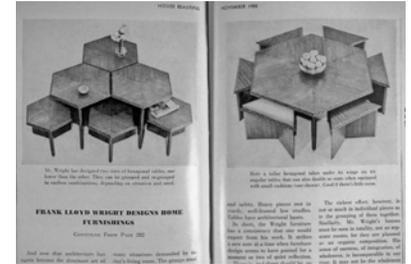


## End of Living Room



## Heritage Henredon

### Hexagonal Furniture



## Jensen

At Wright's suggestion...



## George Nakashima



## Hearth and Ceiling



## Other Ceilings

Francis Little House  
Lake Minnetonka,  
Minnesota  
1912-14  
(Metropolitan Museum of Art)



Herbert Jacobs House



## Other Examples



Lloyd Lewis House  
Libertyville, Illinois  
1940

## Balcony



## Overhang



## Dining Room



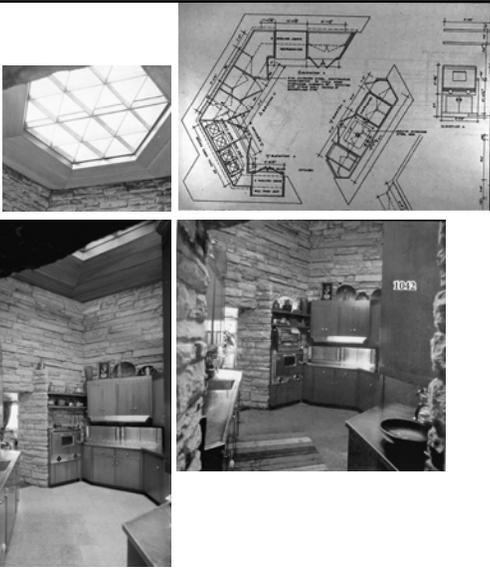
## Dining Room Tables



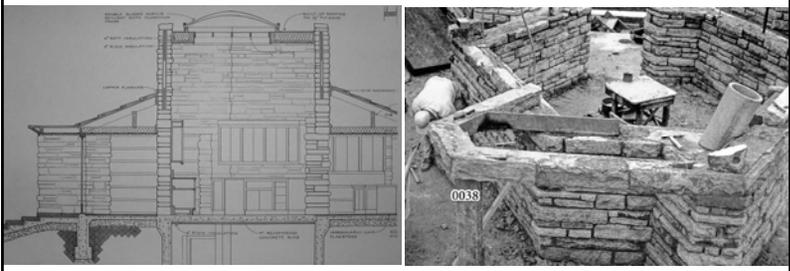
## Other Hexagonal Dining Rooms



# Kitchen



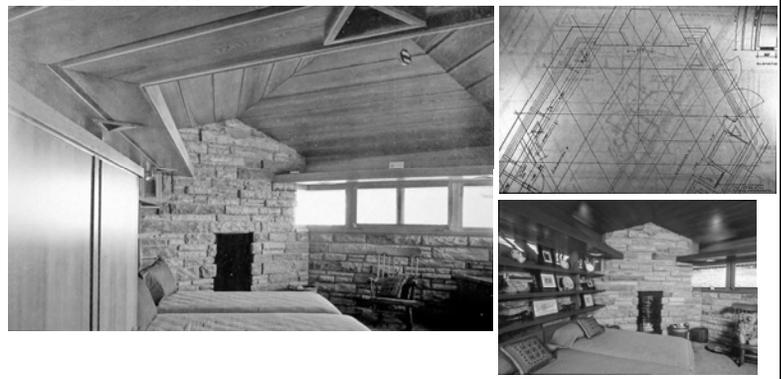
# Kitchen: Section and Construction



# Other Kitchens



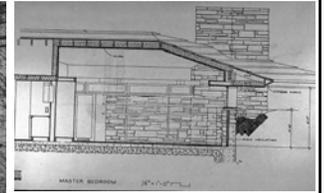
# Bedroom



## Other Hexagonal Beds



## Bedroom and Hill



The entrance is at grade,  
but the bedroom is buried.

## House Beautiful



**AS BUILT DRAWINGS [A]**

- A1 AREA TOPO AND PHOTO
- A2 AS-BUILT SITE PLAN
- A3 AS-BUILT PLAN
- A4 REFLECTED CEILING PLAN
- A5 ROOF PLAN
- A6 FRAMING PLAN
- A7 RADIANT HEATING PLAN
- A8 COURTYARD ELEVATIONS
- A9 GARDEN ELEVATIONS
- A10 MAGNIFIED PLAN
- A11 WINDOW DETAIL
- A12 BUILT-IN SEAT/SHELVES ELEVATION/PLAN
- A13 LIVING ROOM SECTION
- A14 PLANTER/HEARTH SECTION
- A15 DINING AREA SKYLIGHT SECTION
- A16 DENTIL AND LIGHT DETAIL
- A17 KITCHEN SECTION
- A18 KITCHEN SKYLIGHT FRAME DETAIL
- A19 KITCHEN AND DINING PLAN
- A20 KITCHEN CABINETRY DETAILS
- A21 MASTER BEDROOM SECTION
- A22 MASTER BEDROOM SECTION 2
- A23 EAVE DETAIL SECTION
- A24 MASTER BEDROOM PLAN
- A25 BEDROOM CASEWORK

**DESIGN PROCESS AND WORKING DRAWINGS [B]**

- B1 INITIAL PERSPECTIVES
- B2 INITIAL PERSPECTIVES 2
- B3 INITIAL PLANS
- B4 SITE PLAN
- B5 MECHANICAL PLAN
- B6 PLAN
- B7 FRAMING PLAN
- B8 ELEVATIONS
- B9 SECTIONS
- B10 MILLWORK
- B11 (CABINET DETAILS)

**PHOTO GALLERIES [C]**

- C1 EXTERIORS
- C2 LIVING ROOM TO PROW
- C3 HEARTH AND DINING ROOM
- C4 KITCHEN . HALL . BEDROOM

**PLAN AND UNIT SYSTEM ANALYSIS [D]**

- D1 UNIT GEOMETRIES ANALYSIS
- D2 KENTUCK KNOB GRID ANALYSIS
- D3 REGULAR PLAN GEOMETRY ANALYSIS
- D4 REGULAR PLAN GEOMETRY ANALYSIS 2
- D5 IRREGULAR PLAN GEOMETRIES
- D6 GRID POTENTIAL
- D7 30-60 PRECEDENT ANALYSIS
- D8 DISSOLVING PLAN ANALYSIS
- D9 HEXAGONAL PLAN ANALYSIS
- D10 PARALLELOGRAM PLAN ANALYSIS
- D11 TRIANGLE PLAN ANALYSIS
- D12 PLAN GRID LIST
- D13 STUDENT ANALYSIS/DESIGN

**SITING, APPROACH, AND PROMENADE [E]**

- E1 SITE ORIENTATION ANALYSIS 2
- E2 HILLSIDE PHOTOGRAPHS
- E3 ENTRANCE PATHS
- E4 COMPRESSION AND RELEASE ANALYSIS
- E5 VIEW FRAMING

**LIVING ROOM SPATIAL ANALYSIS [F]**

- F1 WRIGHT LIVING ROOMS
- F2 KENTUCK KNOB SECTION ANALYSIS
- F3 SPATIAL ZONES ANALYSIS 1
- F4 SPATIAL ZONES ANALYSIS 2
- F5 SEAT - VIEW ANALYSIS
- F6 SEAT - VIEW ANALYSIS
- F7 CEILING ANALYSIS
- F8 HEXAGONAL FURNITURE
- F9 WOODEN CEILINGS
- F10 WOODEN CEILINGS 2
- F11 LIGHT ORNAMENT
- F12 LIGHT ORNAMENT 2
- F13 MATERIAL SELECTION
- F14 STEEL STRUCTURE
- F15 STEEL STRUCTURE TWO
- F16 WINDOW WALLS
- F17 WINDOW WALLS TWO
- F18 INTERIOR - EXTERIOR RELATIONSHIP
- F19 INTERIOR - EXTERIOR RELATIONSHIP TWO

**CUTOUT WINDOWS [G]**

- G1 CUTOUT GEOMETRY ANALYSIS
- G2 CUTOUT COMPARISON
- G3 CLERESTORY ARRANGEMENTS
- G4 POPE-LEIGHEY COMPARISON
- G5 AULDBRASS COMPARISON
- G6 SAMARA COMPARISON
- G7 CUTOUT WINDOWS
- G8 CUTOUT WINDOWS TWO
- G9 CUTOUT WINDOWS THREE
- G10 NATURE AND GEOMETRY
- G11 NATURE AND GEOMETRY TWO
- G12 FROEBEL GEOMETRIES
- G13 LOUIS SULLIVAN
- G14 EXOTIC INFLUENCES
- G15 JAPAN
- G16 MODERN ART
- G17 SCREENS

**FURNITURE [H]**

- H1 LIVING ROOM FURNITURE
- H2 BUILT-IN FURNITURE
- H3 BUILT-IN SEAT COMPARISON
- H4 HEXAGONAL ROOMS
- H5 COMPARISON DETAILS
- H6 COMPARISON DETAILS TWO
- H7 OTHER DESIGNERS
- H8 OTHER DESIGNERS TWO
- H9 OTHER DESIGNERS THREE
- H10 HEXAGONAL FURNITURE
- H11 HEXAGONAL FURNITURE

**EXTERIOR OVERHAND AND TRELLIS [J]**

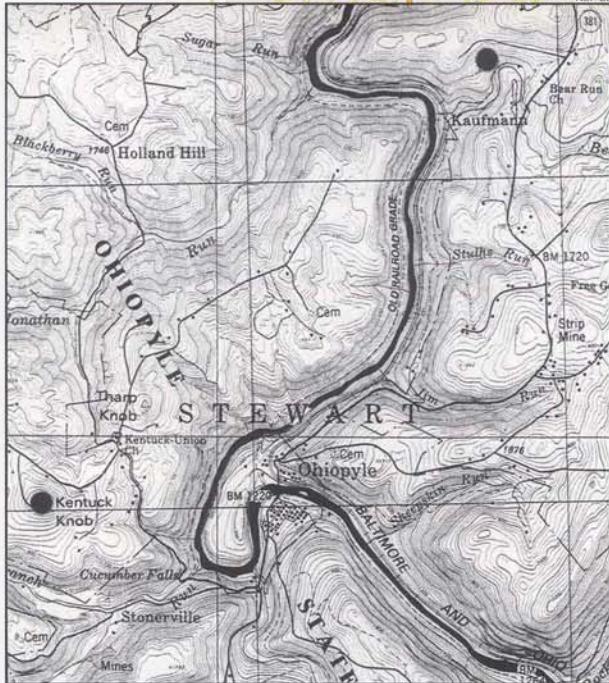
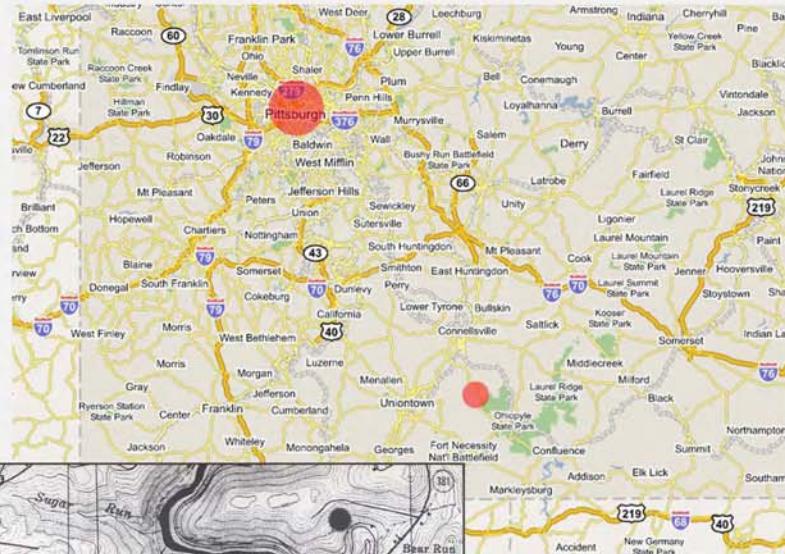
- J1 HAGAN TRELLIS GEOMETRY ANALYSIS
- J2 SUN PATH ANALYSIS
- J3 OVERHANG PLAN GEOMETRY ANALYSIS
- J4 PERGOLAS DETAIL
- J5 WRIGHT: TELLIS AND CUTOUTS
- J6 MODERNIST EXAMPLE
- J7 MODERNIST: TRELLIS AND CUTOUTS
- J8 MODERNIST: EAVE DETAILS
- J9 SKYLIGHT SECTIONAL GEOMETRY
- J10 WRIGHT DENTILS

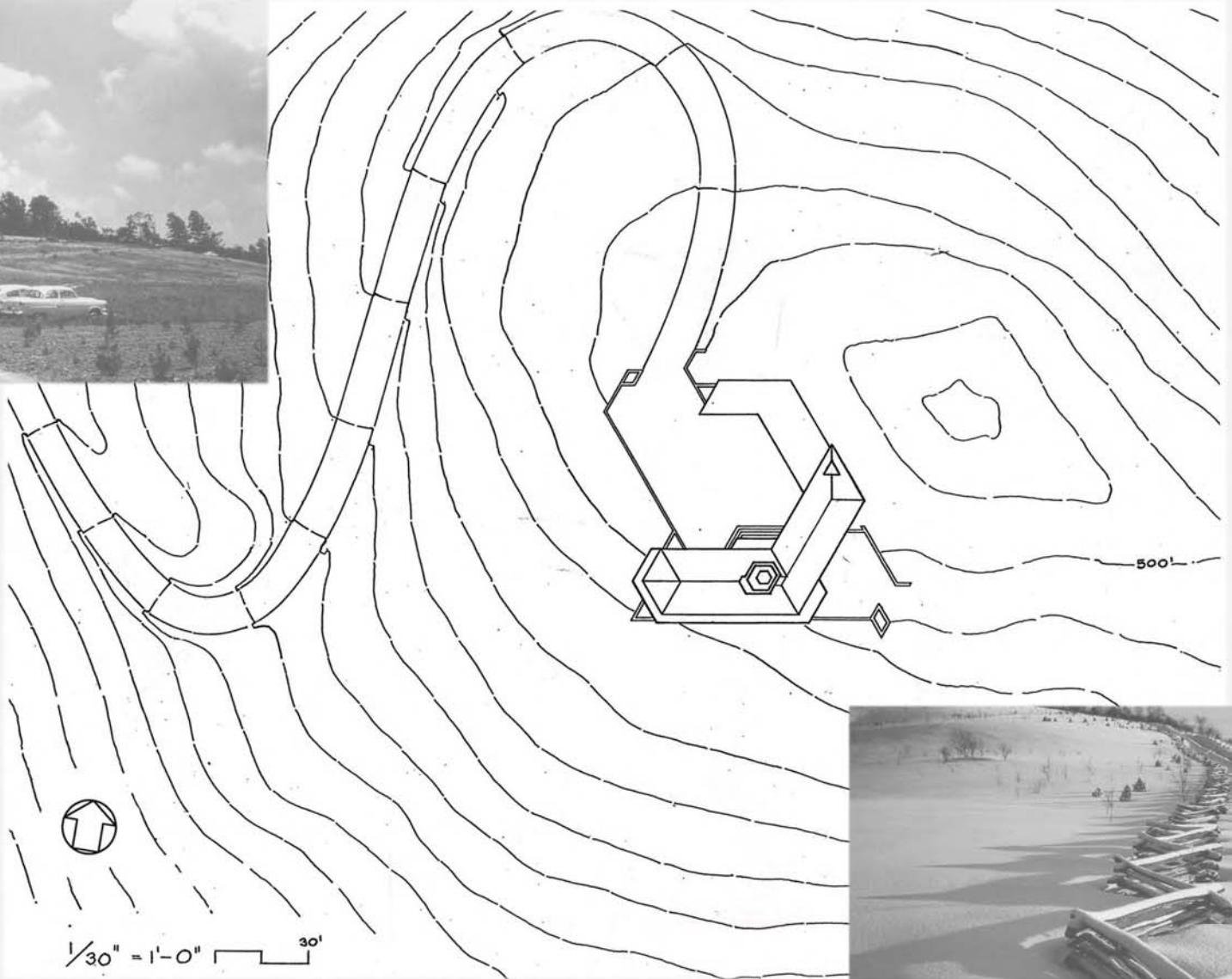
# AS BUILTS

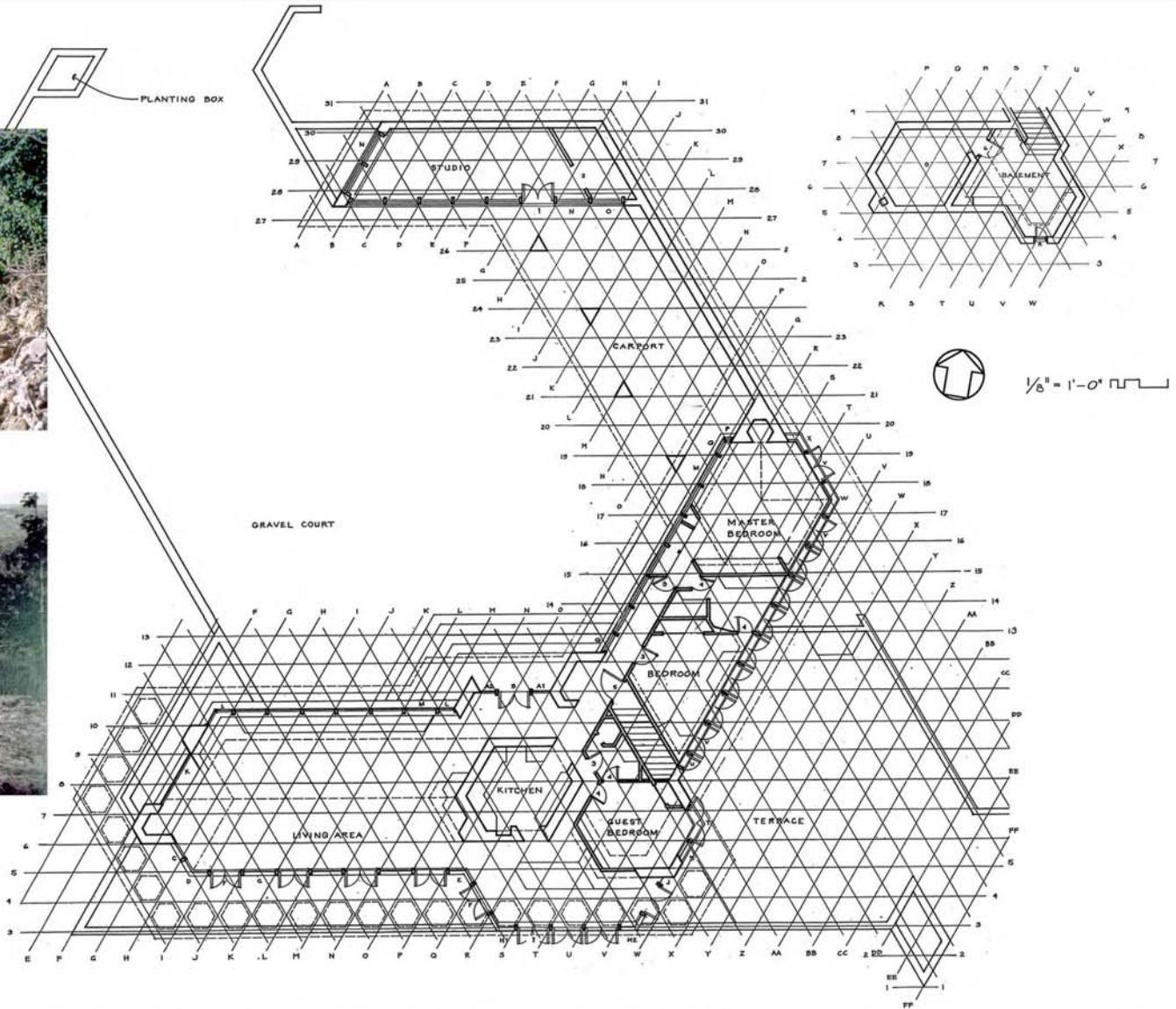
:: DRAWINGS AND PHOTOGRAPHS

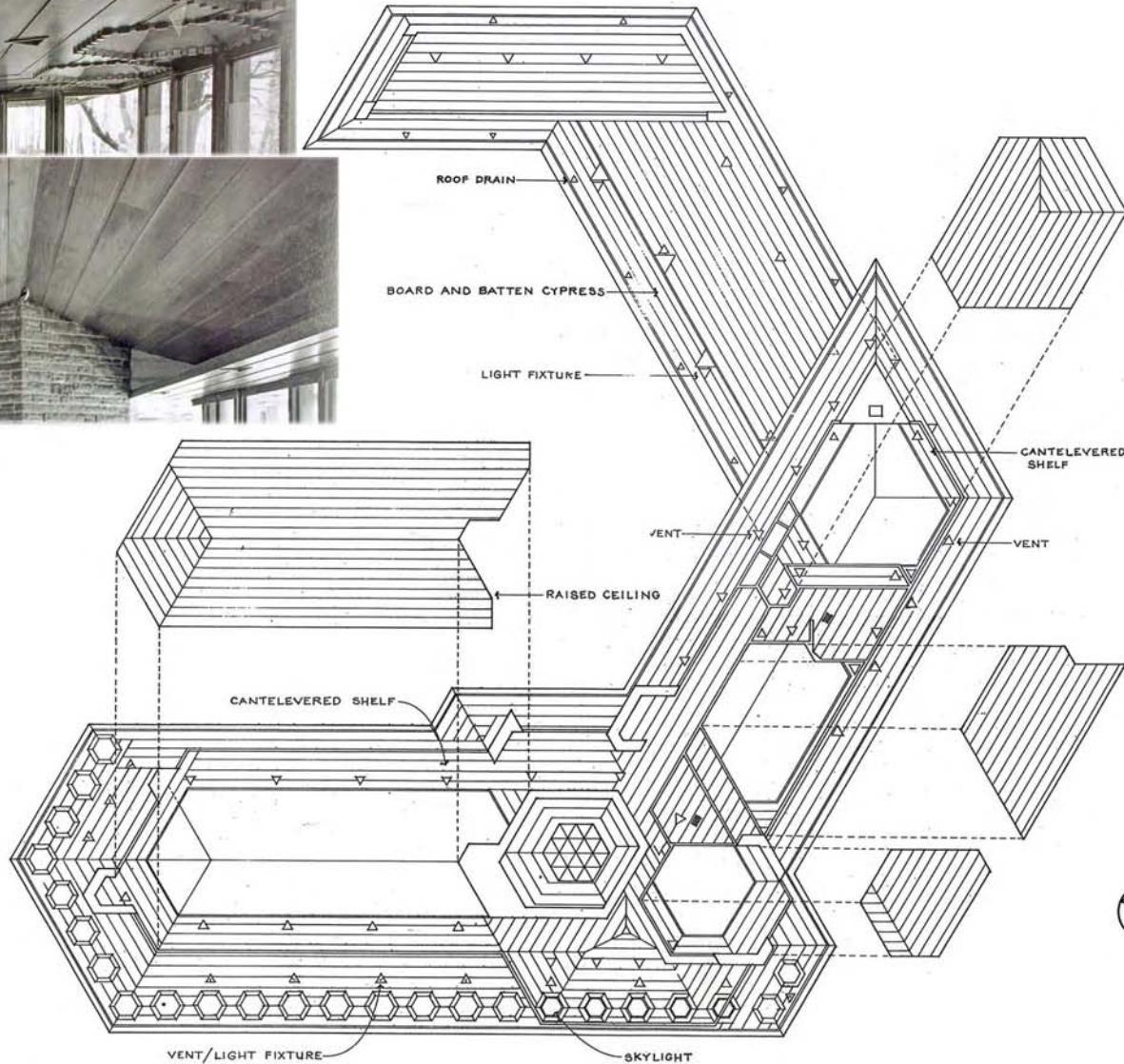
CARNEGIE  
MELLON  
UNIVERSITY  
ARCHITECTURE

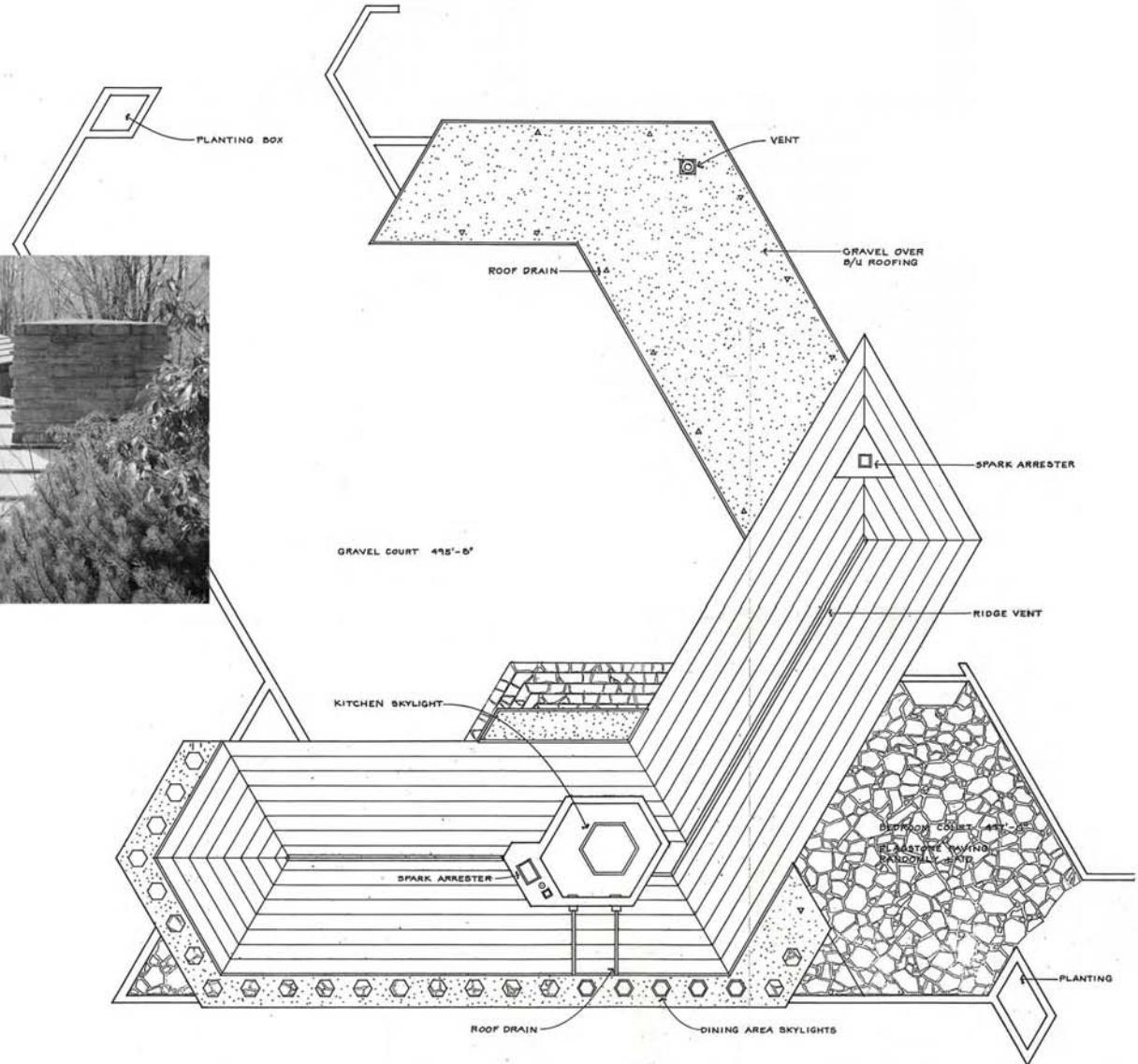
F. L. WRIGHT'S HOUSE FOR I. N. HAGAN, CHALK HILL, PA 1953 - 1956  
**KENTUCK KNOB**  
PRECEDENT :: ANALYSIS :: TRANSFORMATION

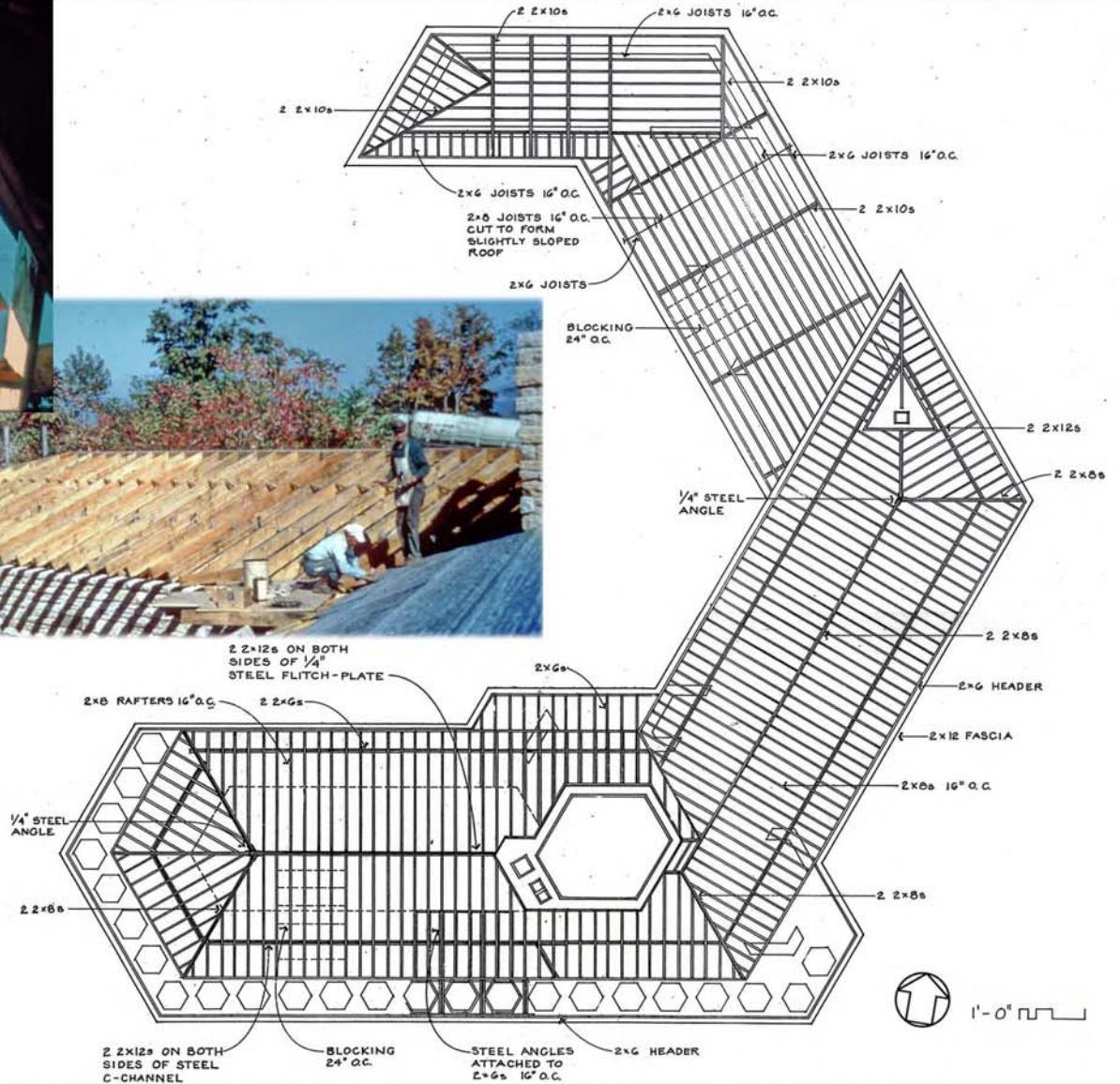






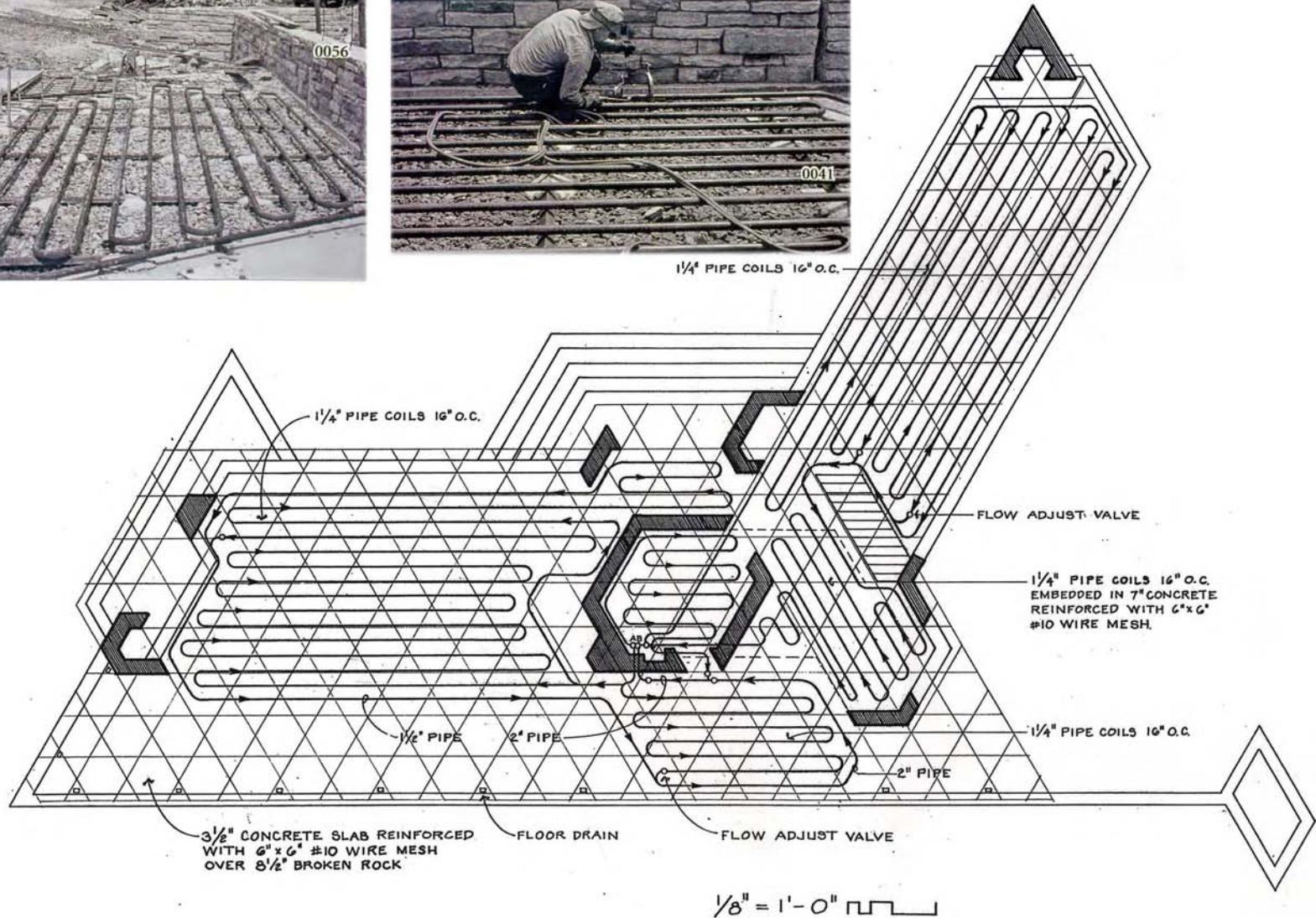


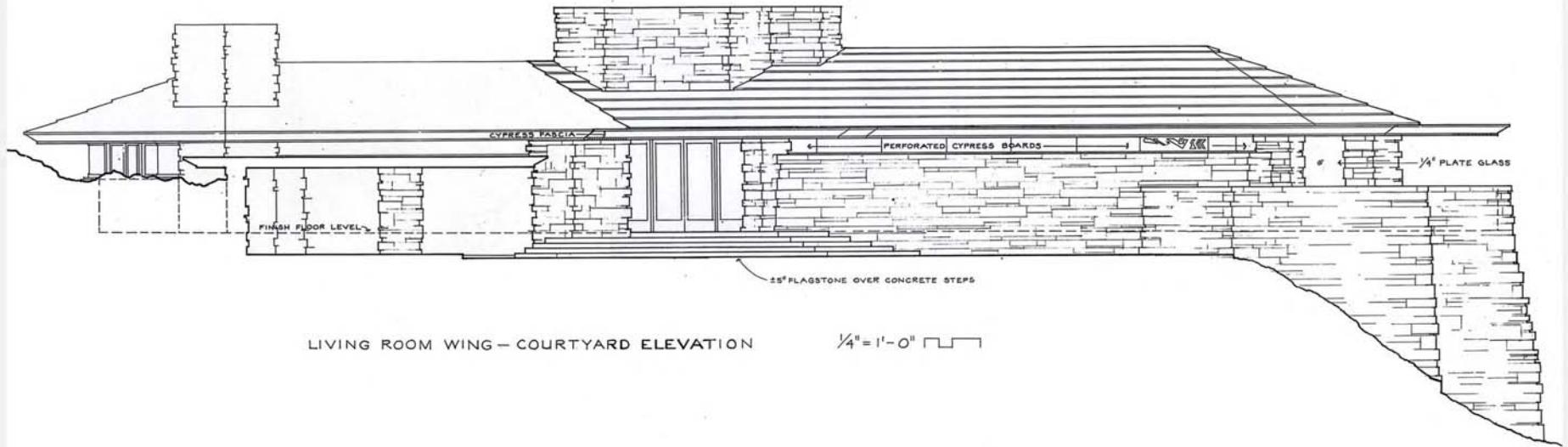






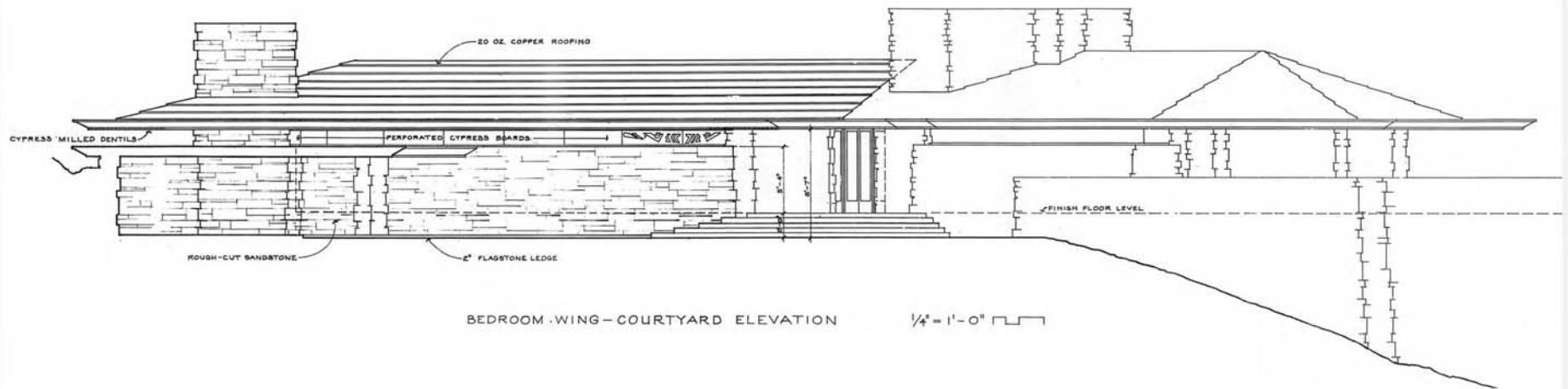
1/4" PIPE COILS 16" O.C.





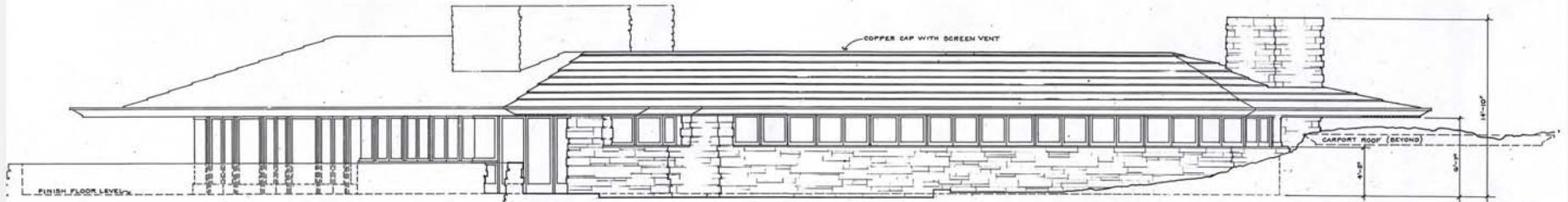
LIVING ROOM WING - COURTYARD ELEVATION

1/4" = 1'-0"

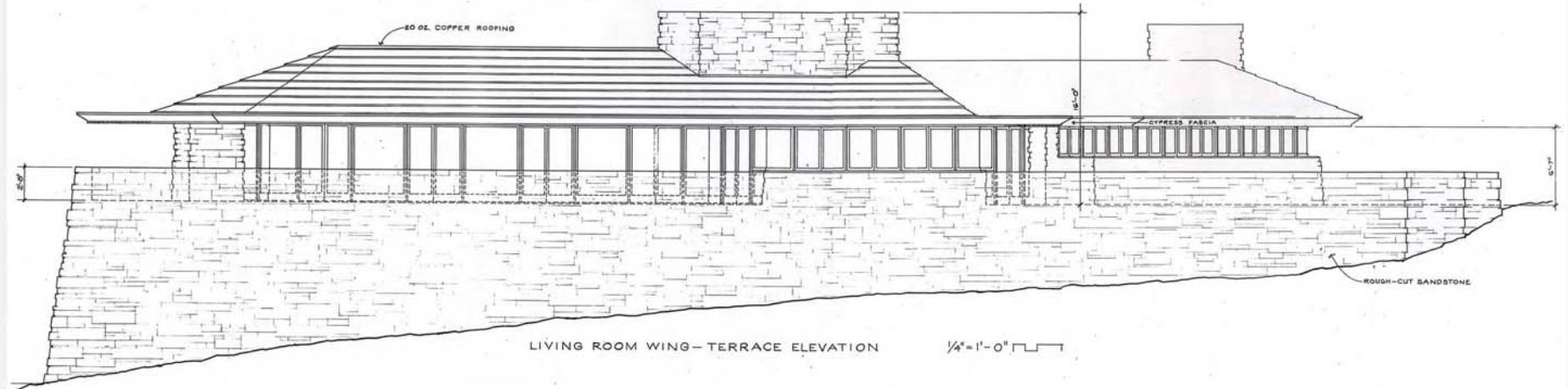


BEDROOM WING - COURTYARD ELEVATION

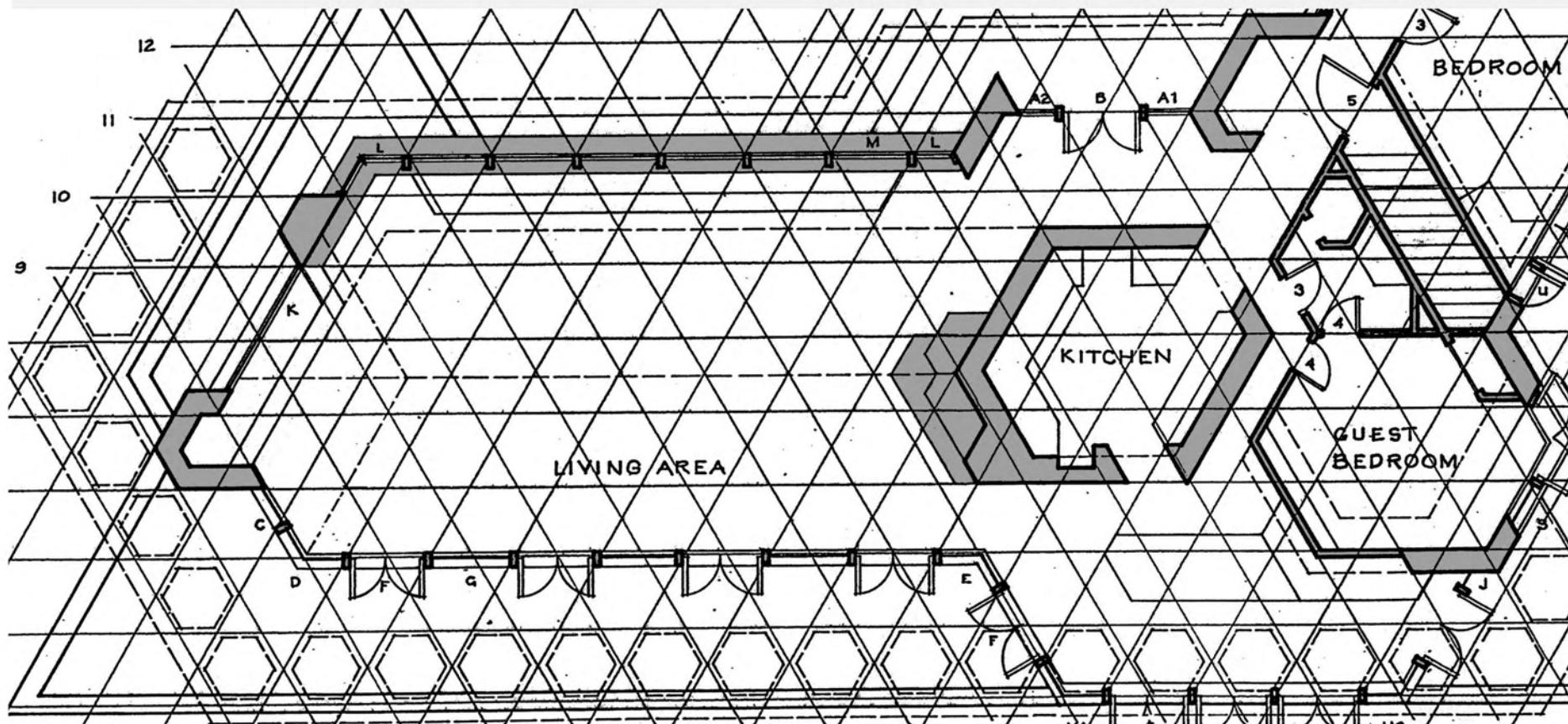
1/4" = 1'-0"

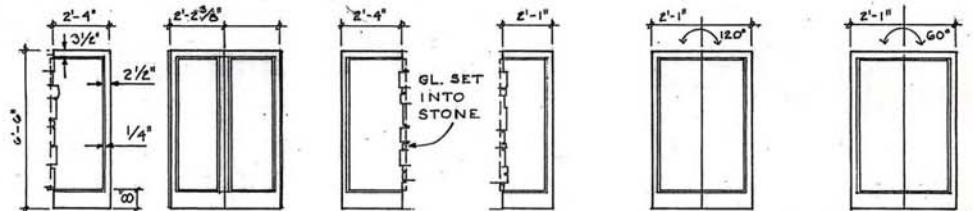


BEDROOM WING-GARDEN ELEVATION  $\frac{1}{4}''=1'-0''$

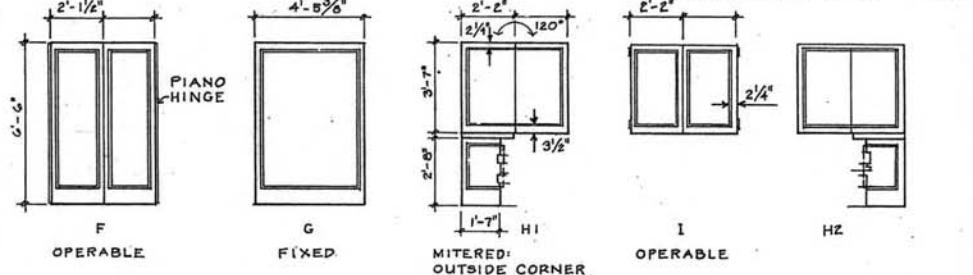


LIVING ROOM WING-TERRACE ELEVATION  $\frac{1}{4}''=1'-0''$

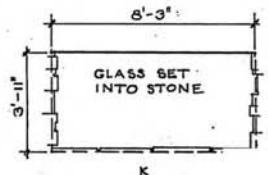




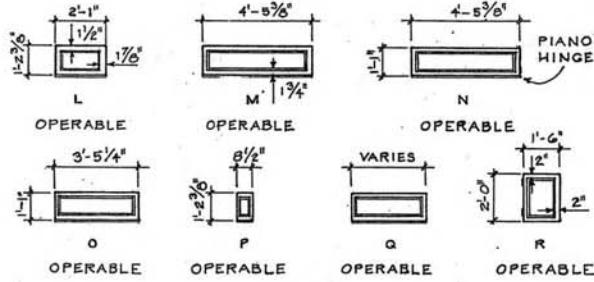
A1 FIXED    B OPERABLE    A2 FIXED    C FIXED    D MITERED: OUTSIDE CORNER    E MITERED: INSIDE CORNER



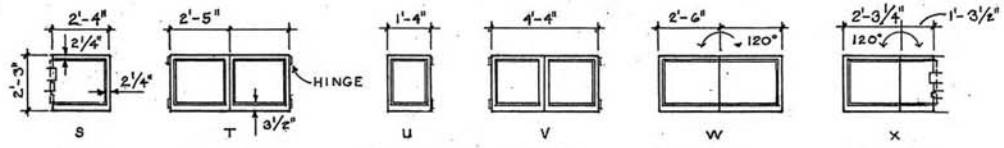
F OPERABLE    G FIXED    H MITERED: OUTSIDE CORNER    I OPERABLE    HZ FIXED



K



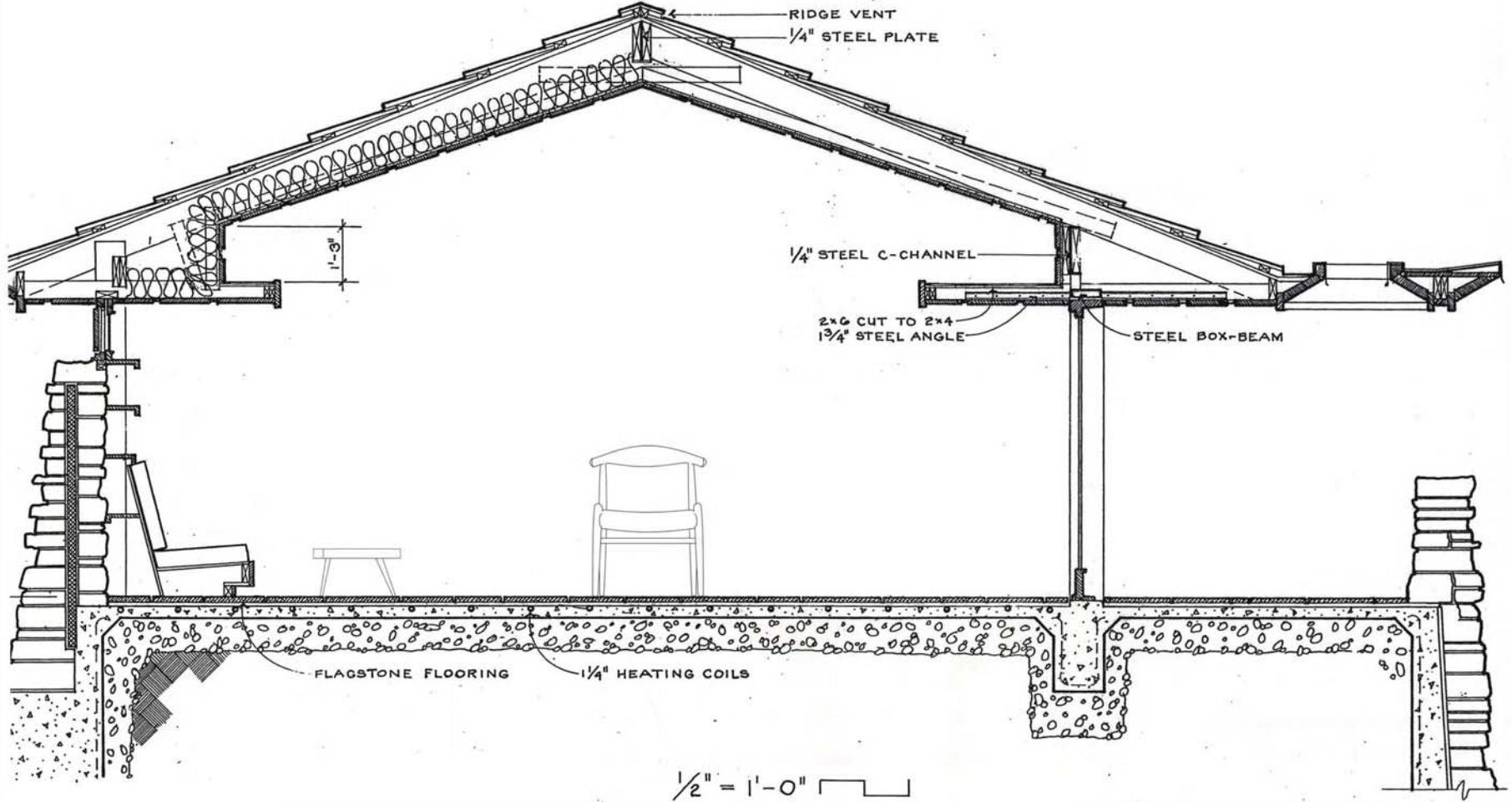
L OPERABLE    M OPERABLE    N OPERABLE    O OPERABLE    P OPERABLE    Q OPERABLE    R OPERABLE



S FIXED    T OPERABLE    U OPERABLE    V OPERABLE    W MITERED: OUTSIDE CORNER    X MITERED: OUTSIDE CORNER

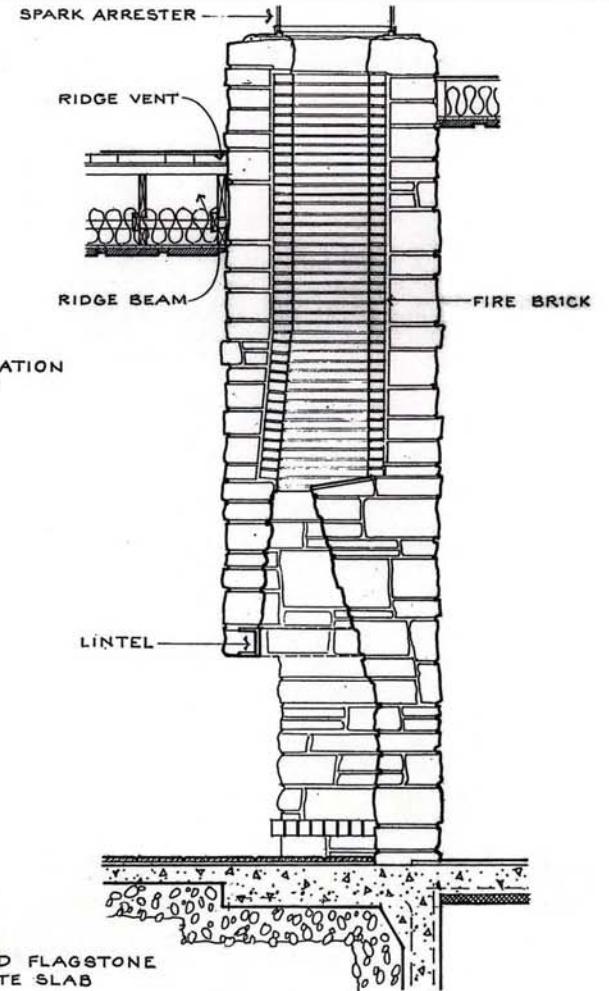
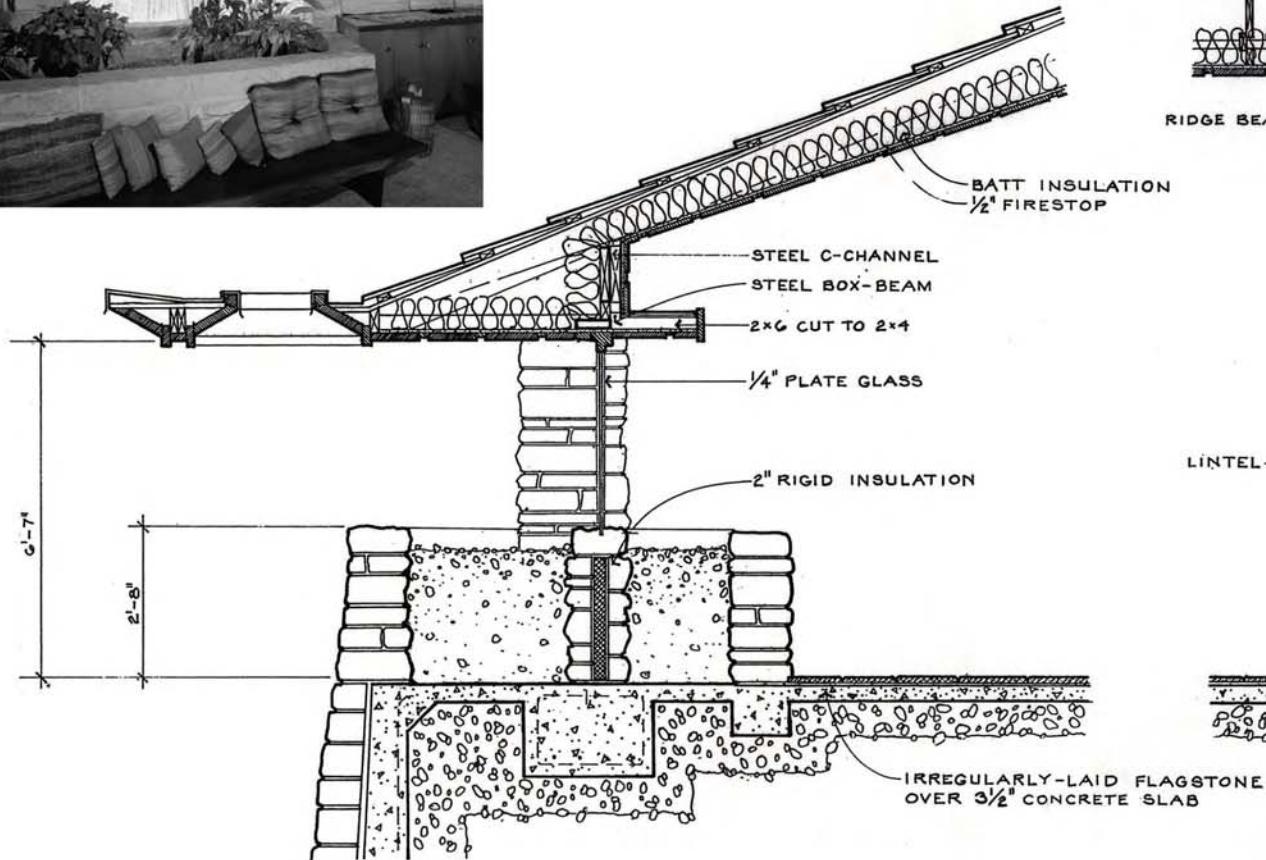




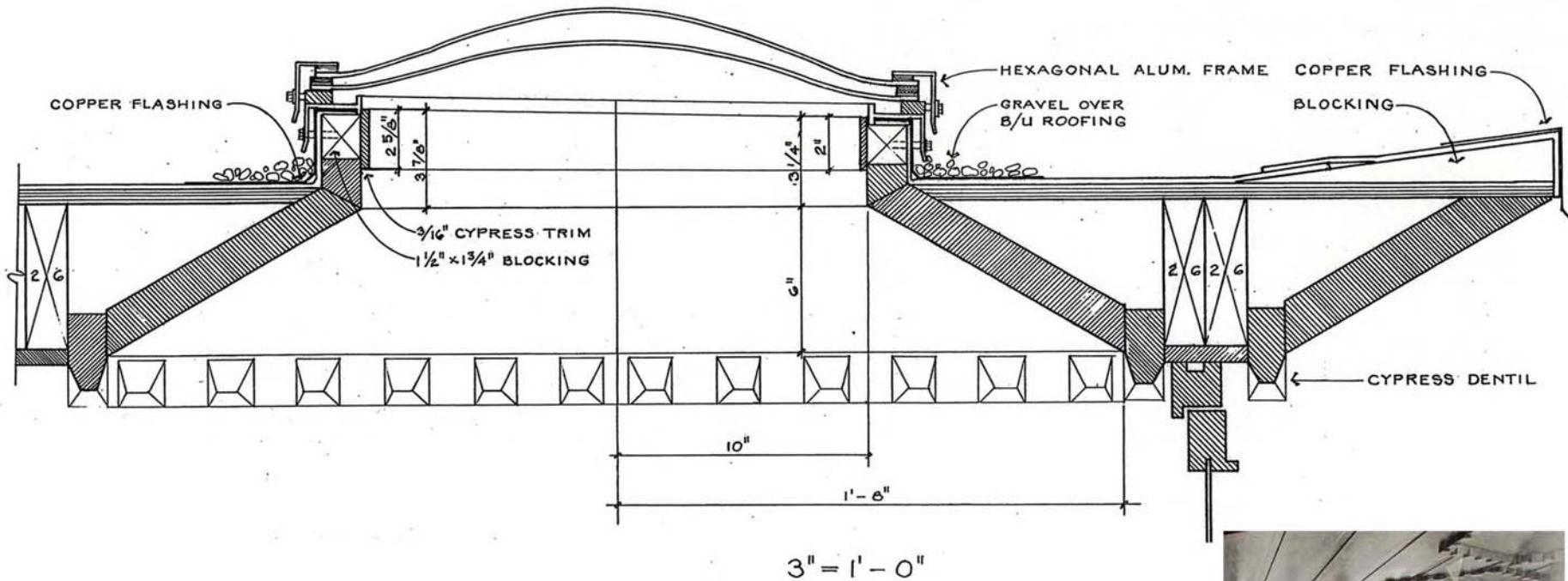


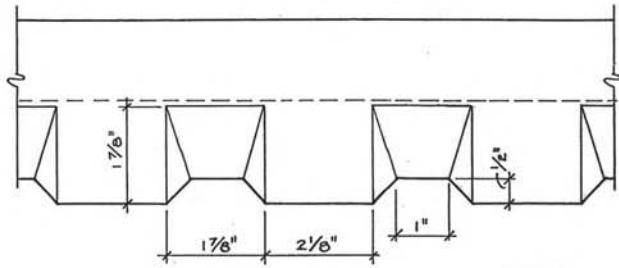


$\frac{1}{2}'' = 1'-0''$

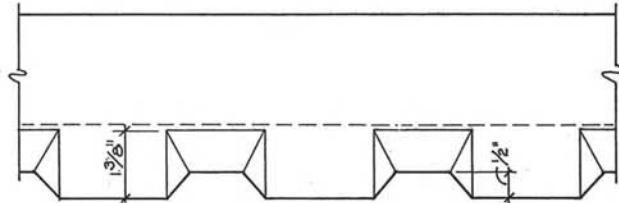


$\frac{1}{2}'' = 1'-0''$

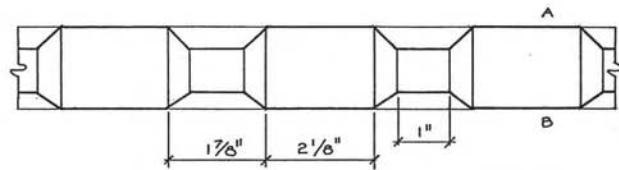




SIDE A

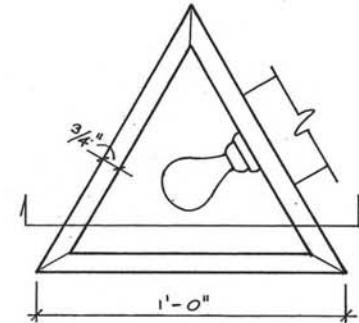
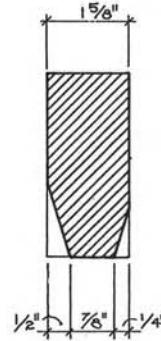
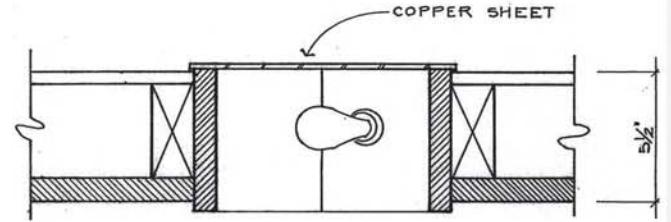


SIDE B



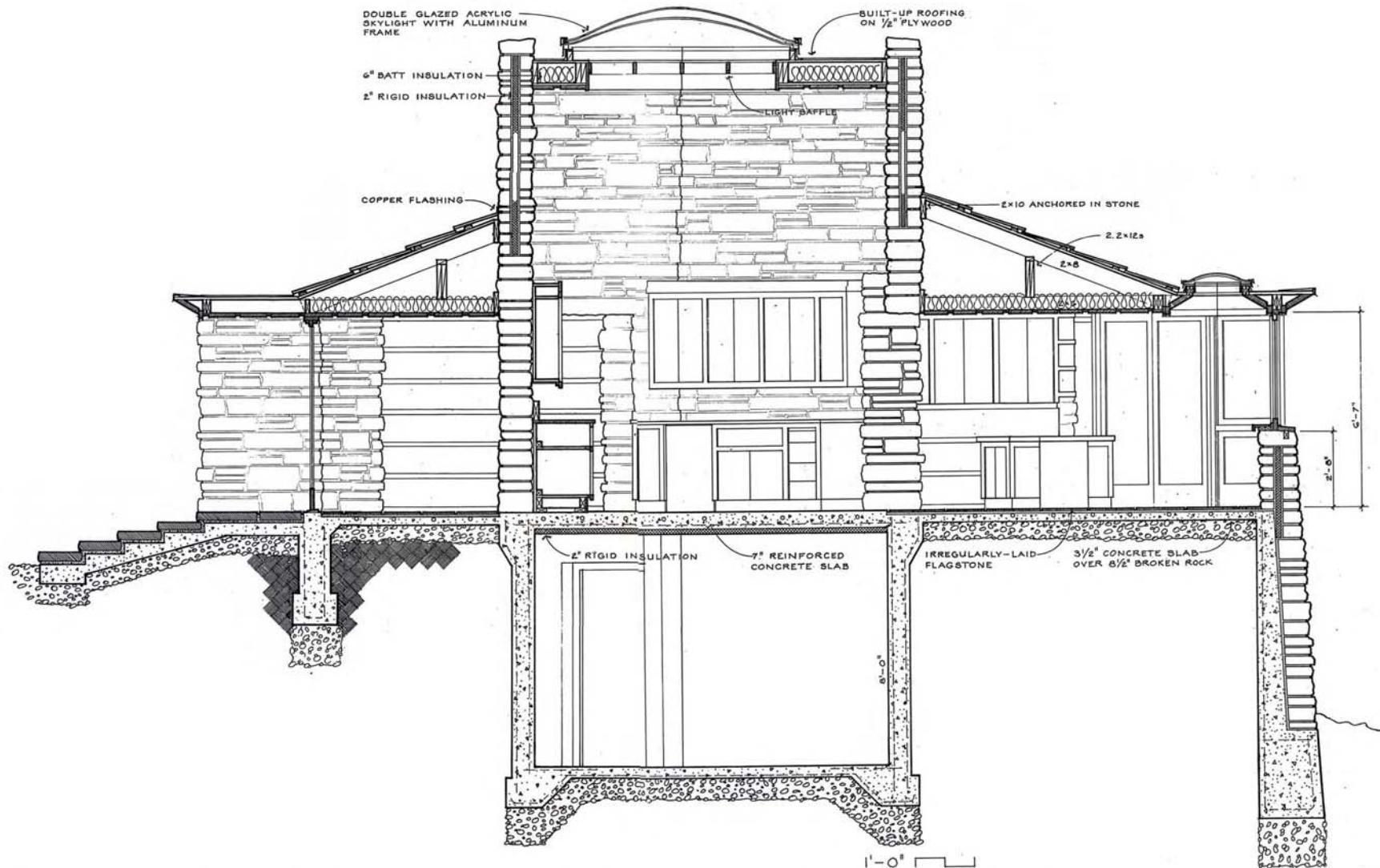
PLAN

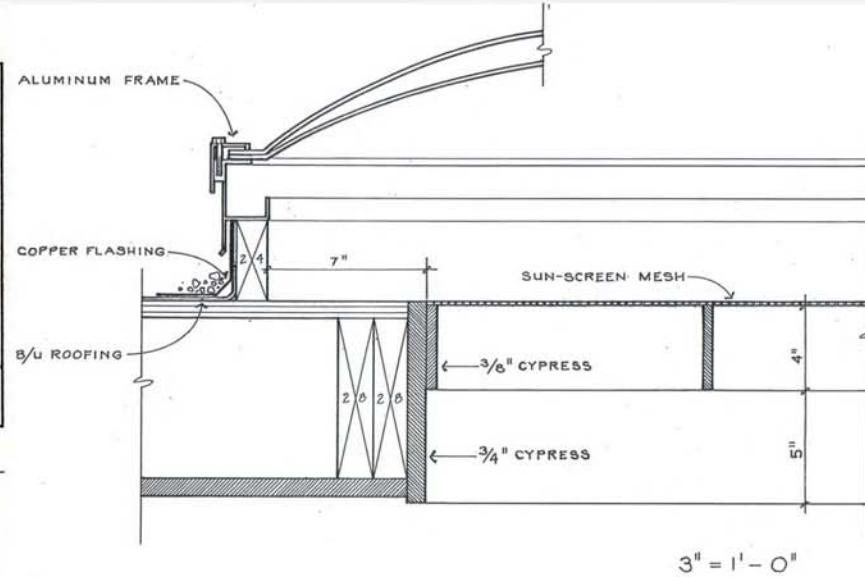
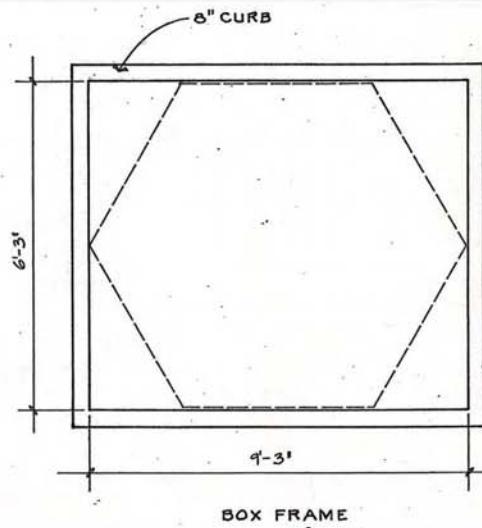
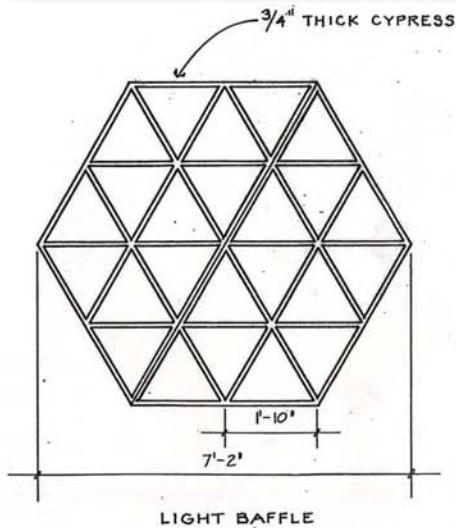
DENTIL DETAIL 6" = 1'-0"



LIGHT BOX 3" = 1'-0"

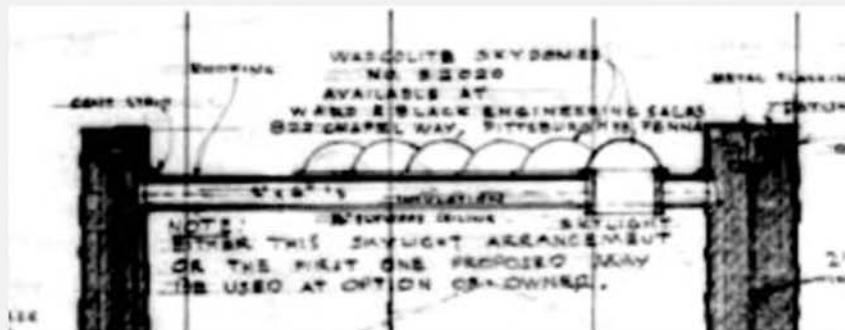




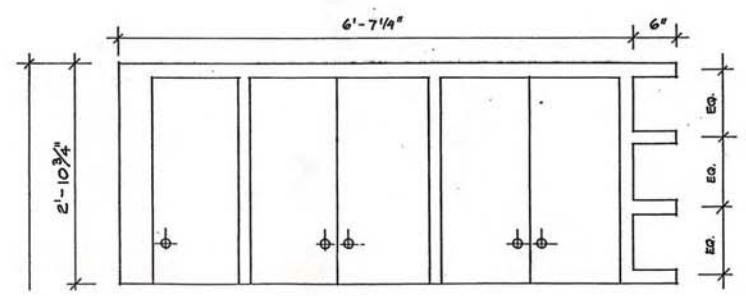
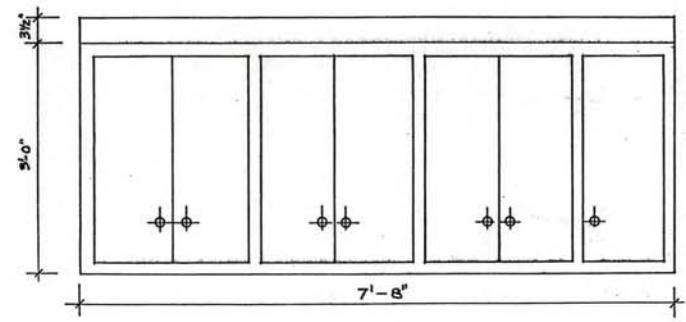
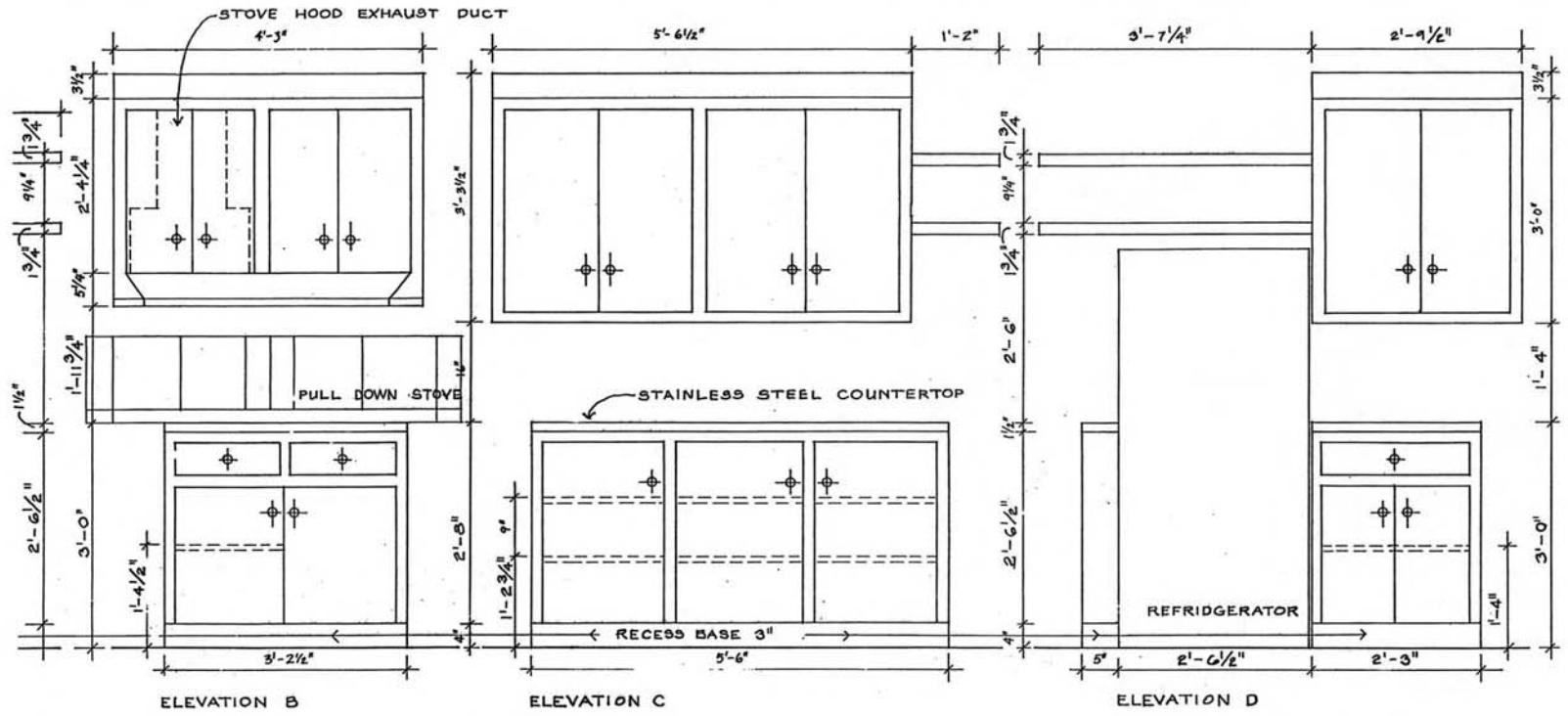


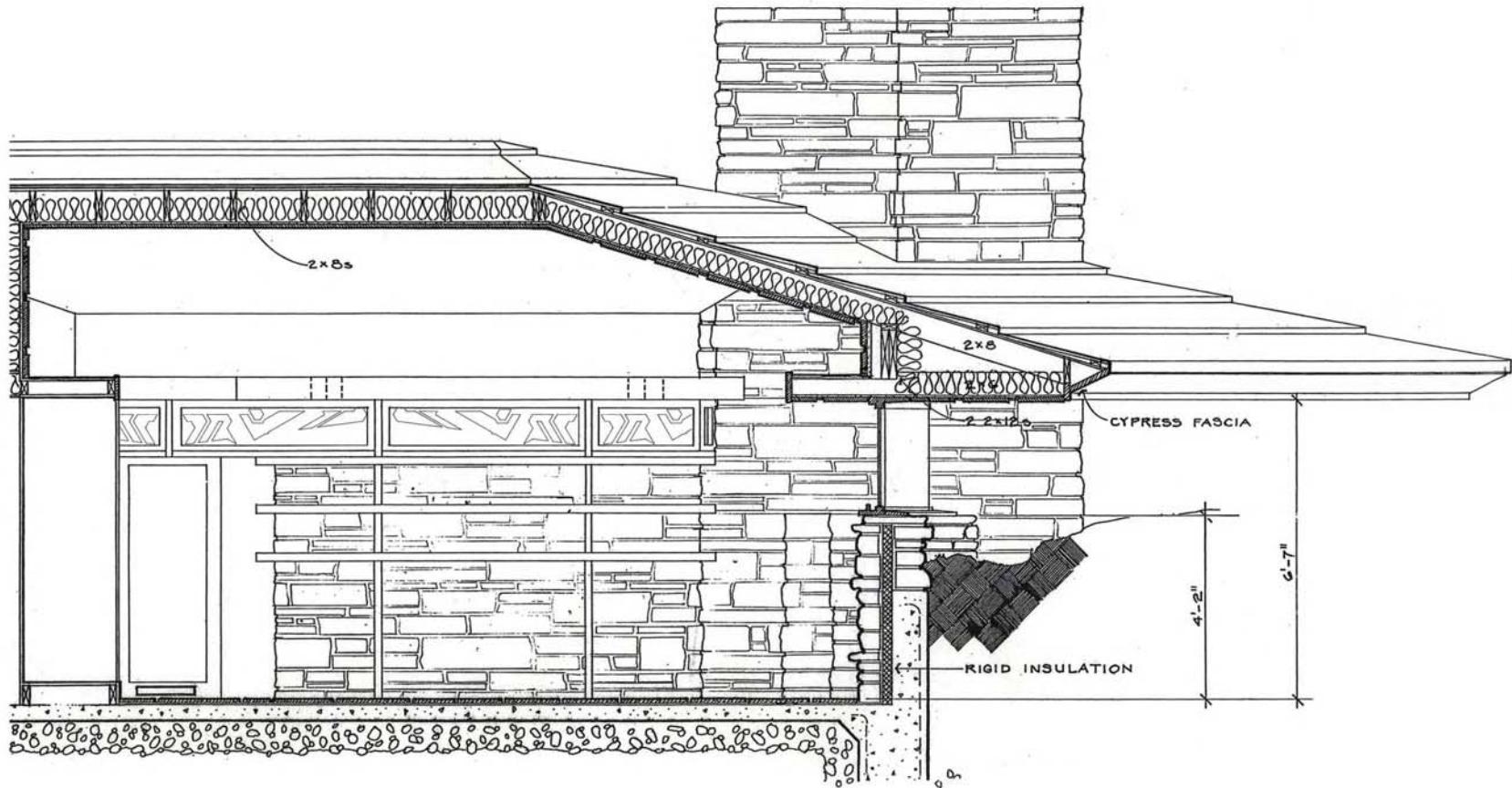
1/2" = 1'-0"

3" = 1'-0"

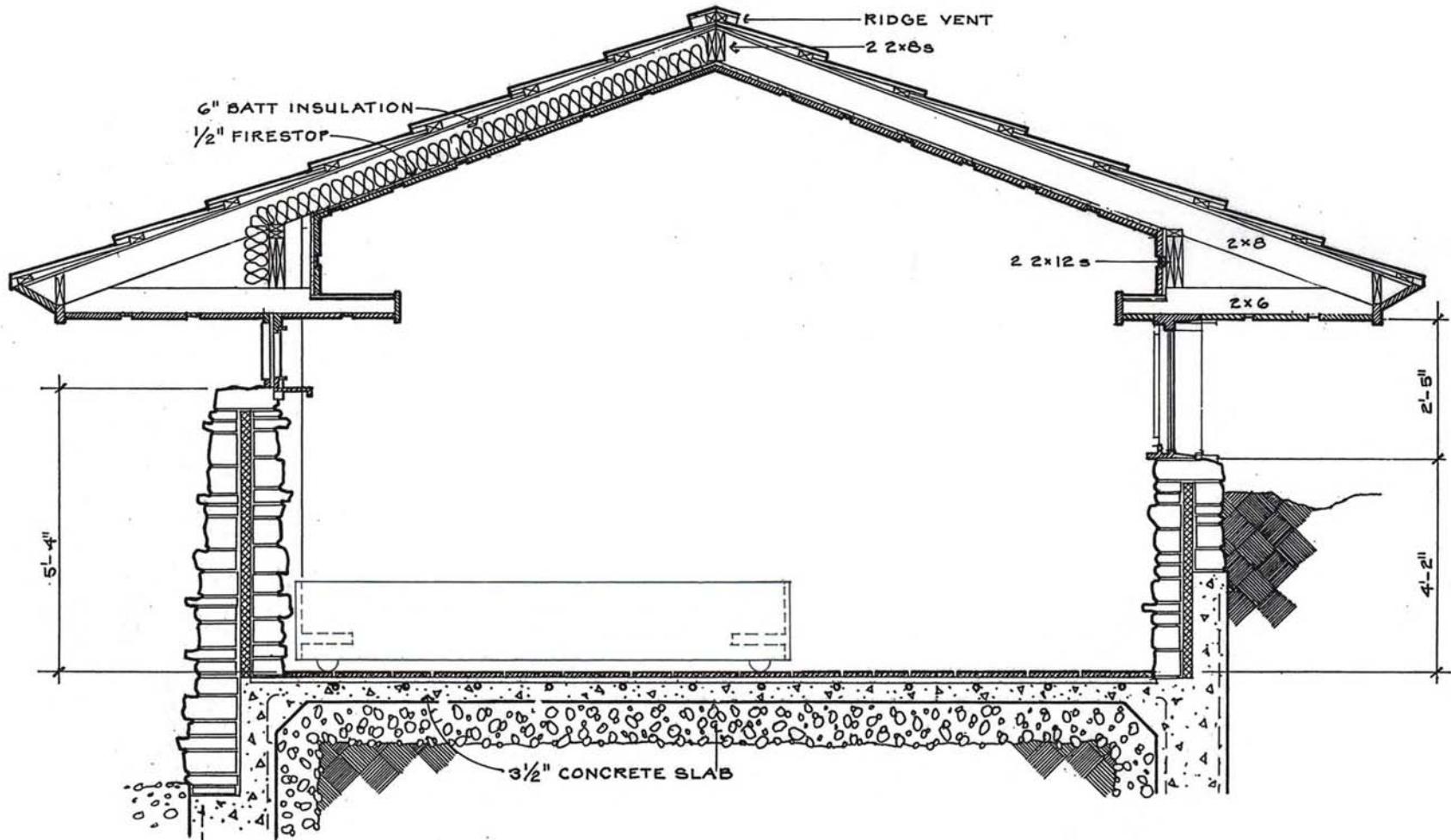




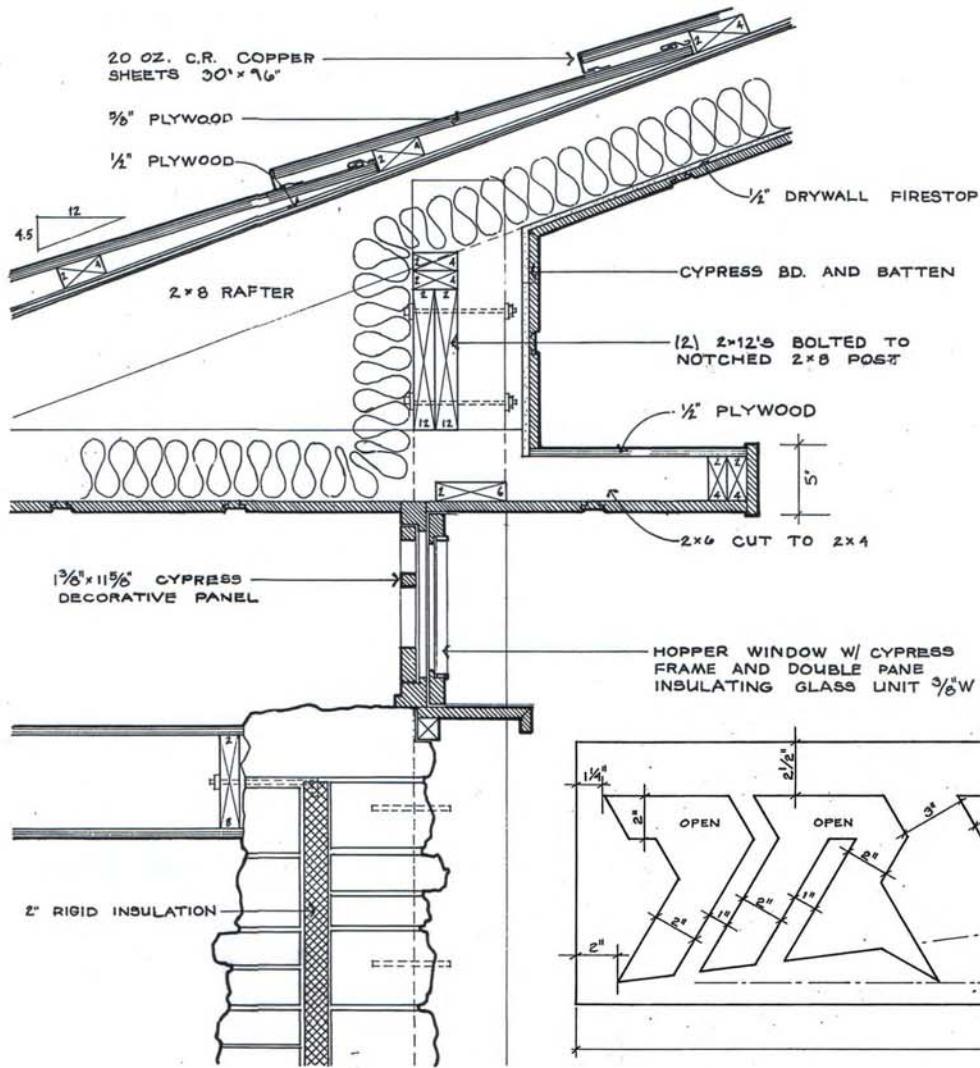




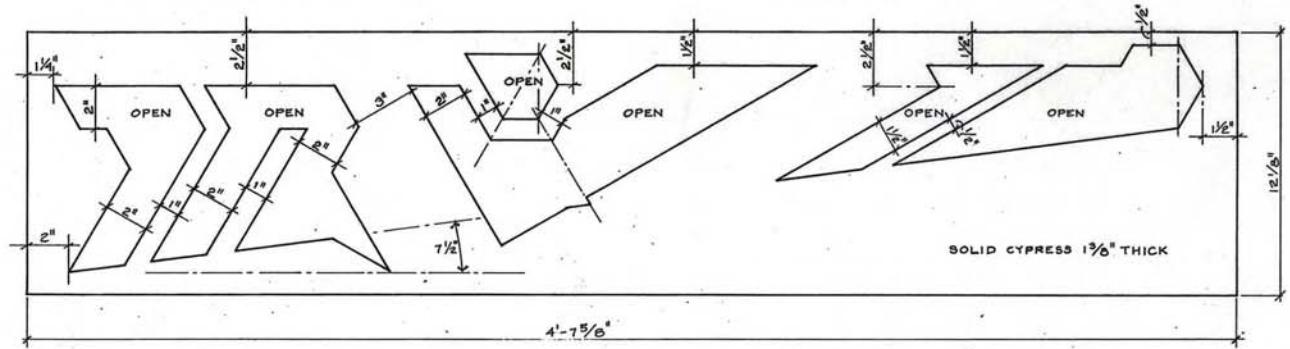
1/2" = 1'-0"



1/2" = 1'-0"

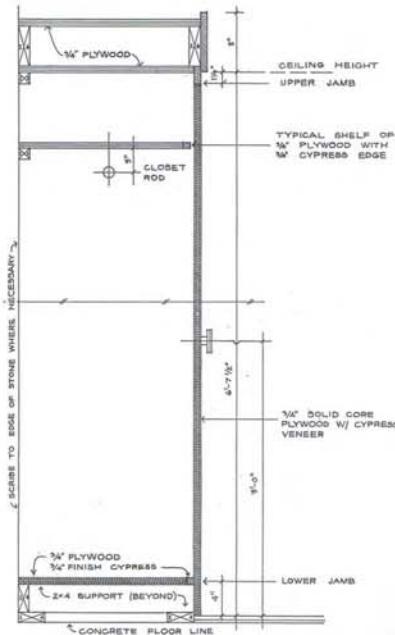


CLERESTORY DETAIL

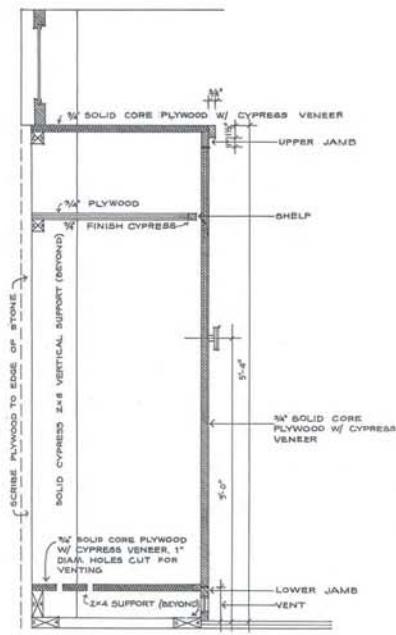


M. BEDROOM - COURTYARD SIDE

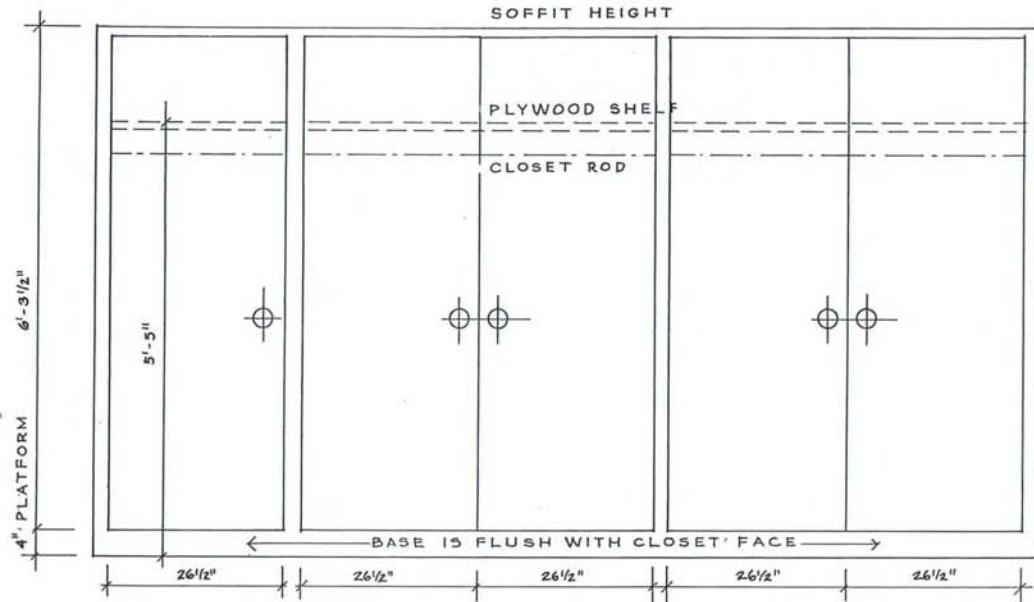




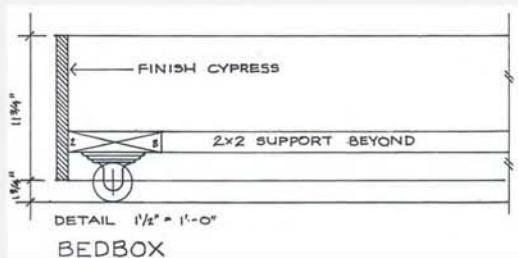
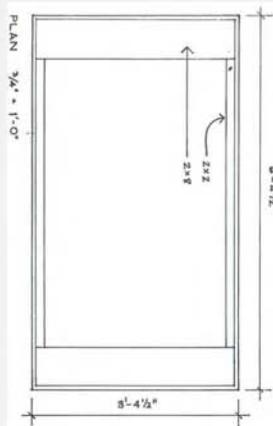
TYPICAL CLOSET



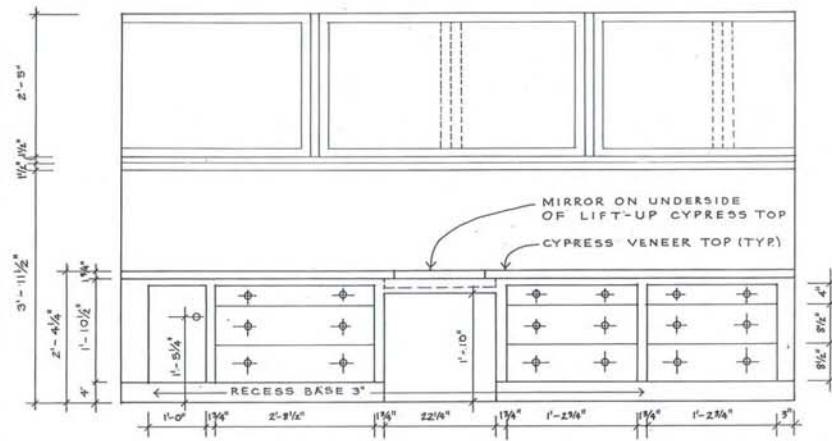
LOWER M. BEDROOM CLOSET



ELEVATION B



BEDBOX



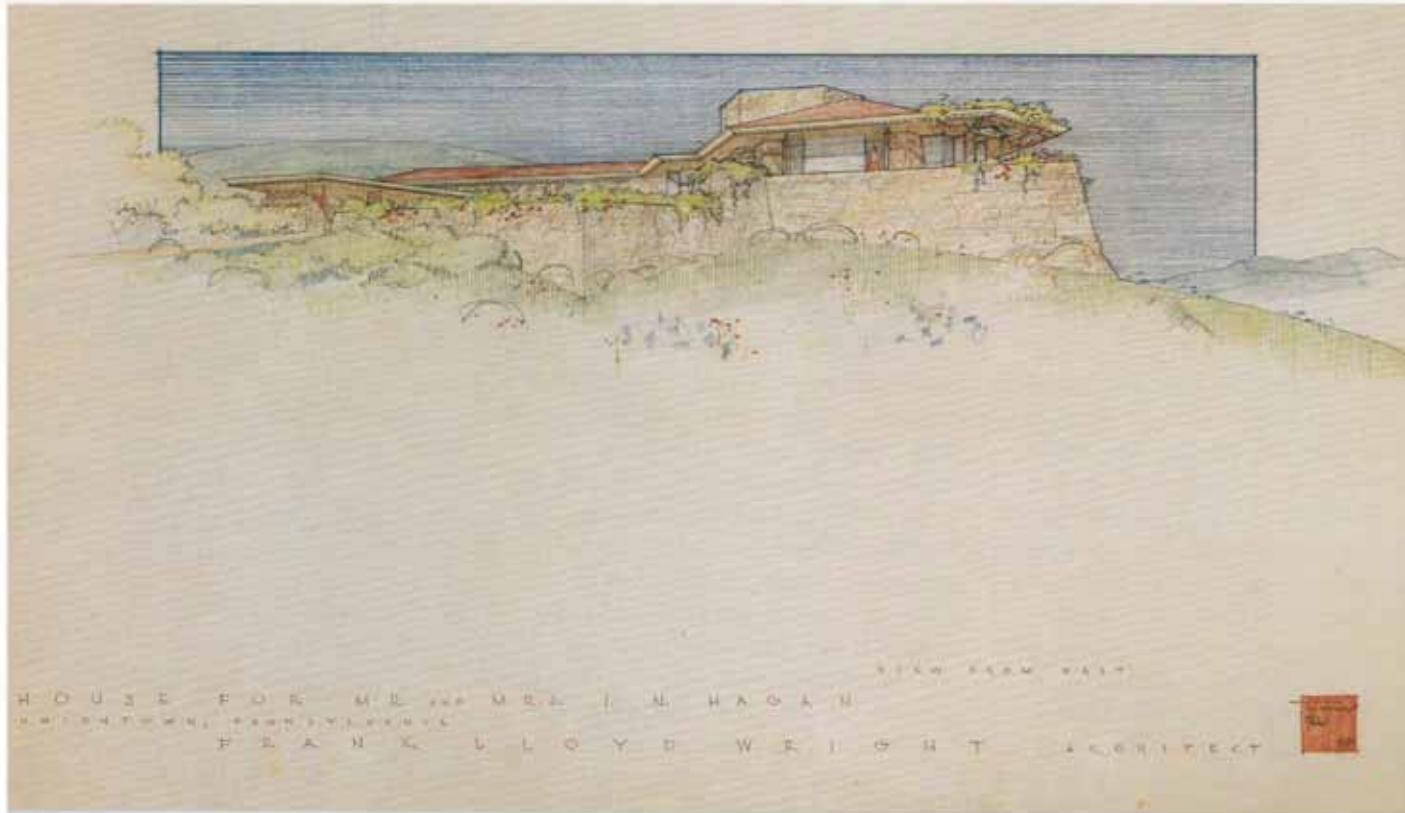
ELEVATION C

# DESIGN.PROCESS

:: AND WORKING DRAWINGS

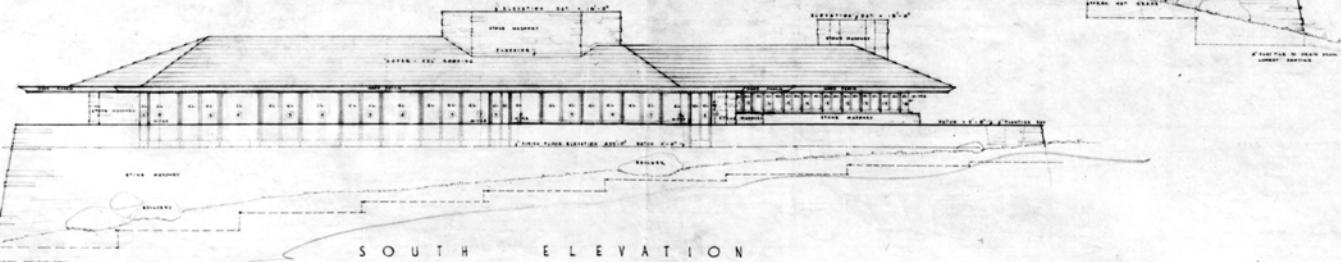
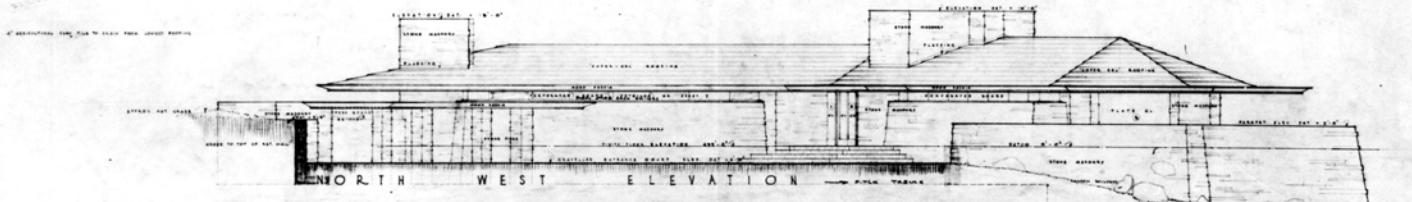
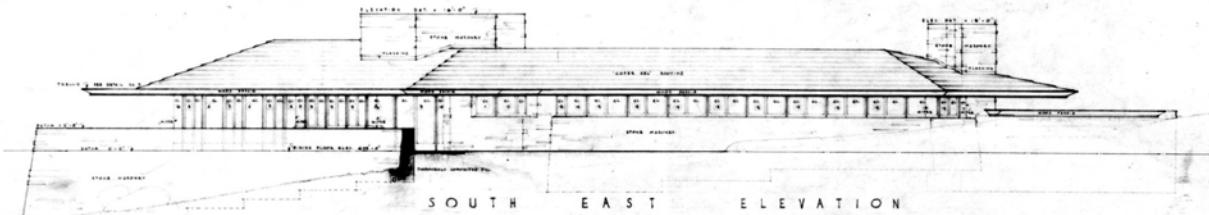
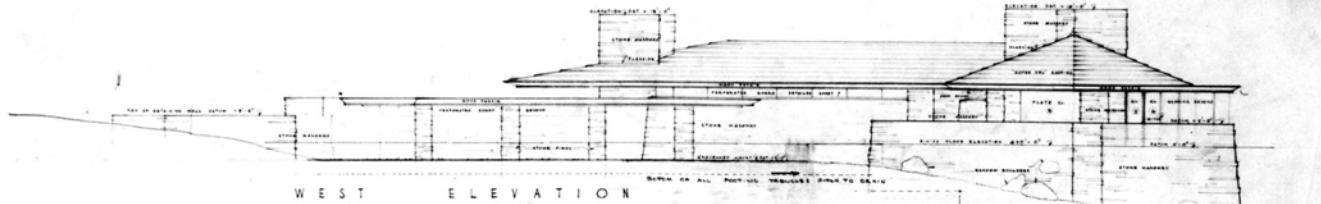
CARNEGIE  
MELLON  
UNIVERSITY  
ARCHITECTURE

F.L.WRIGHT'S HOUSE FOR I.N.HAGAN, CHALK HILL, PA 1953 - 1956  
**KENTUCK KNOB**  
PRECEDENT :: ANALYSIS :: TRANSFORMATION



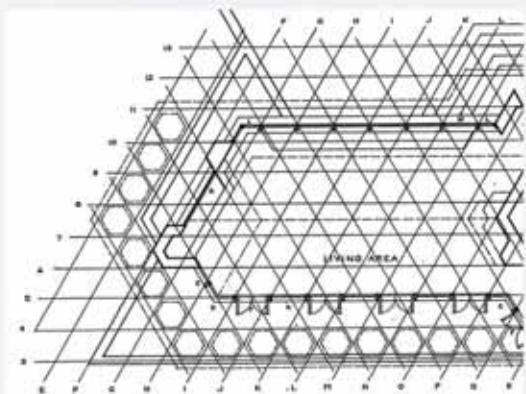
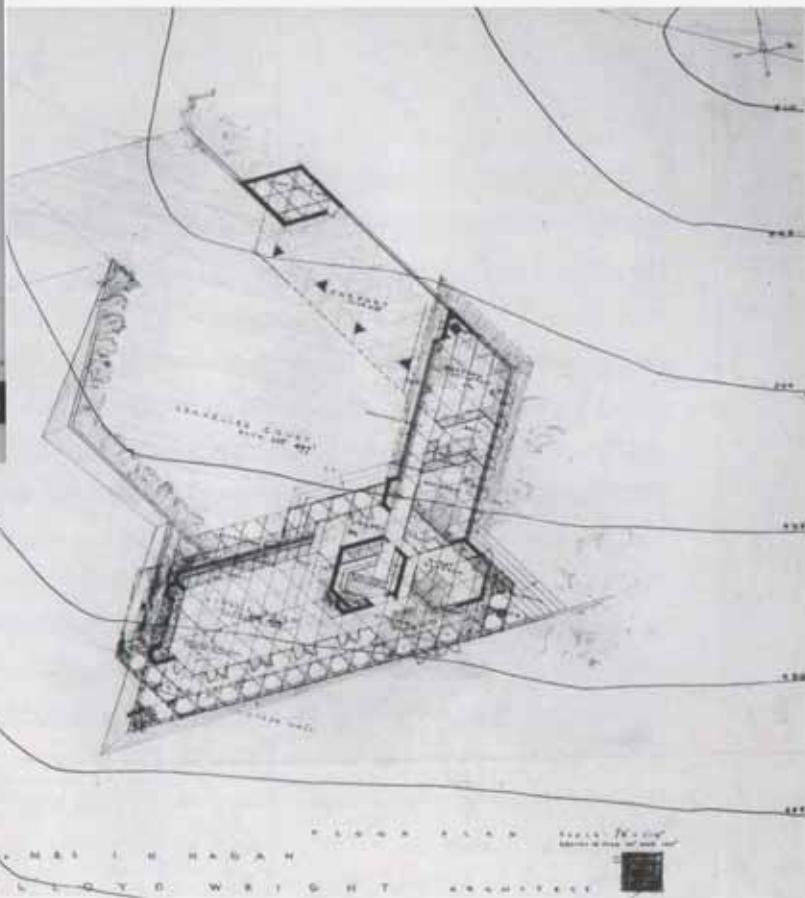
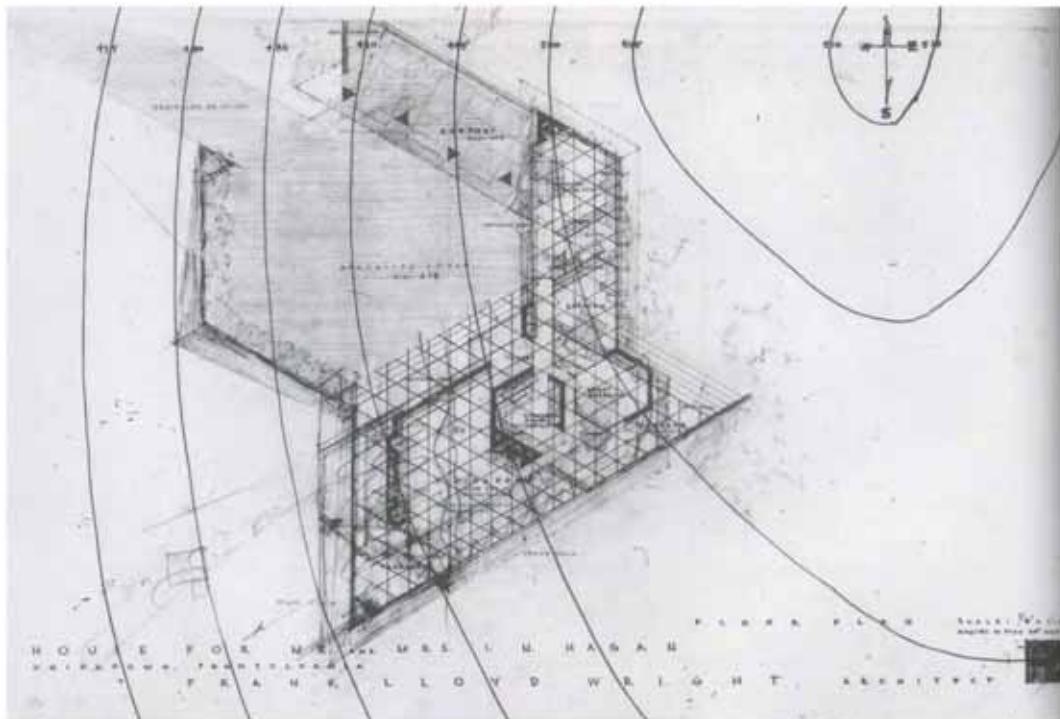
LARGE IMAGE: KENTUCK KNOB, 1954

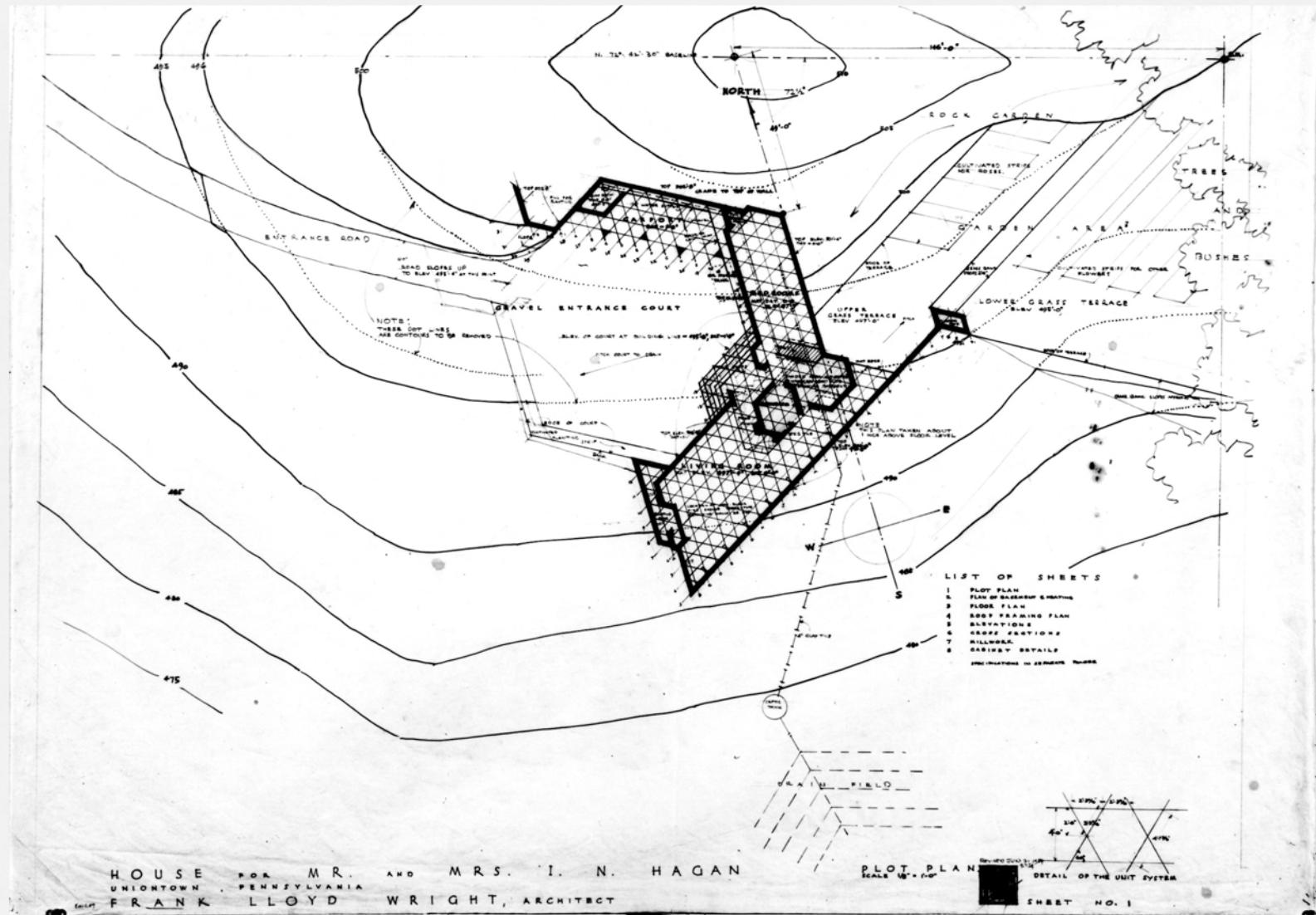
SMALL IMAGES, TOP TO BOTTOM: SAMARA, 1954; BREWER HOUSE, 1953; FALLINGWATER, 1937

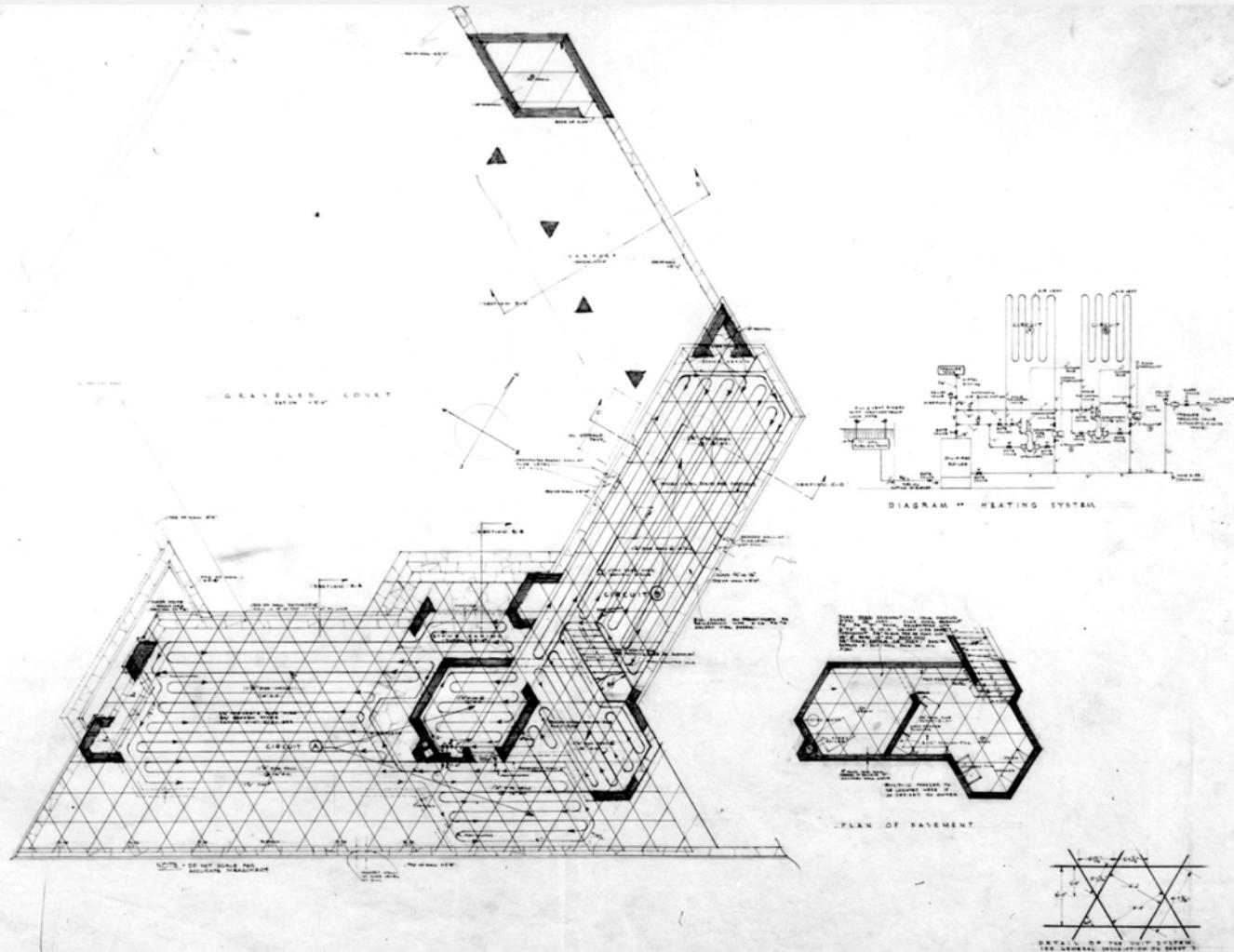


HOUSE FOR MR. AND MRS. I. N. HAGAN  
 UNIONTOWN PENNSYLVANIA  
 FRANK LLOYD WRIGHT

REVISION 100-0 100-0/072  
 ELEVATIONS  
 SCALE 1/4" = 1'-0"  
 ARCHITECT [Redacted] SHEET NO. 5



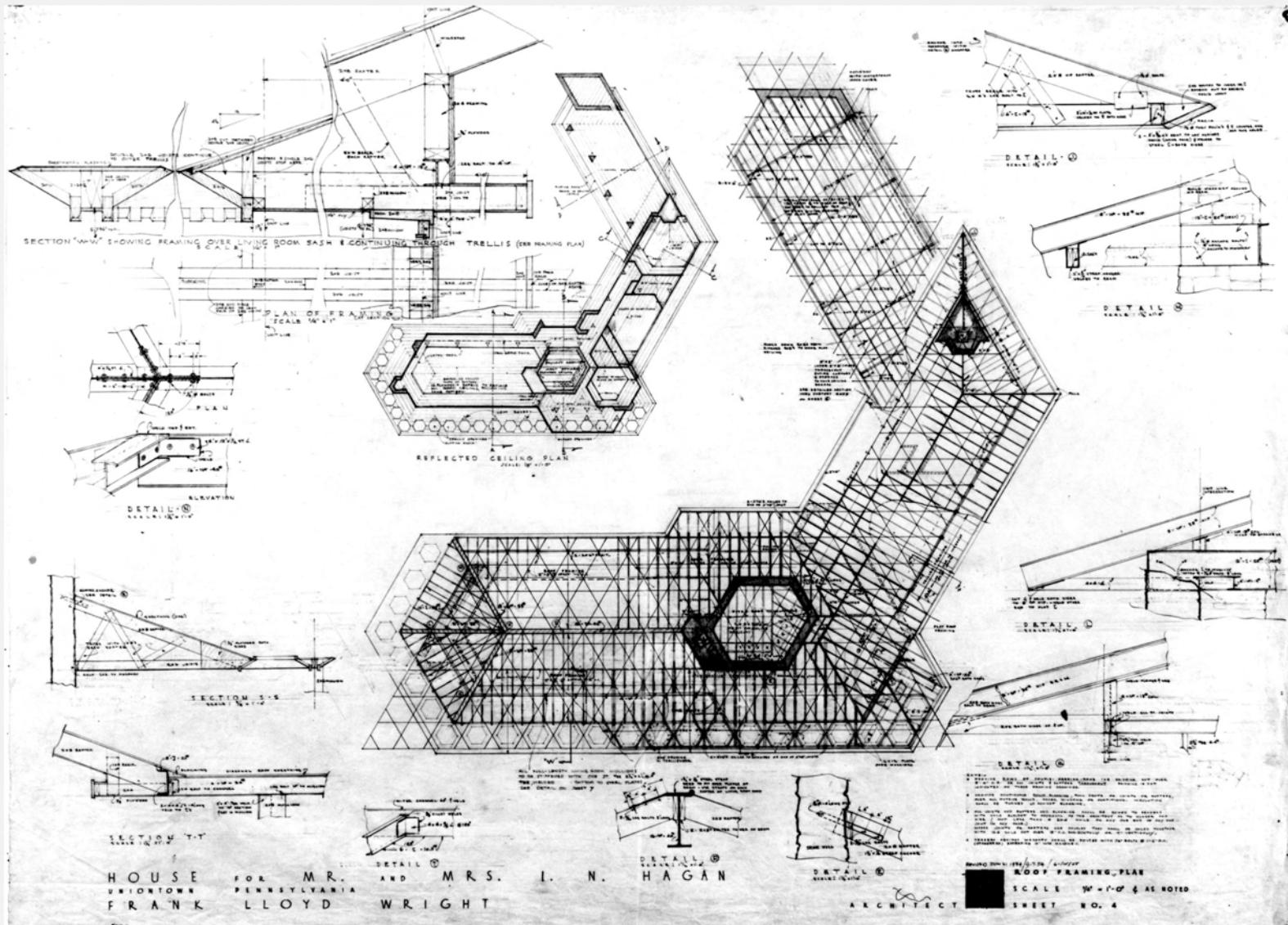


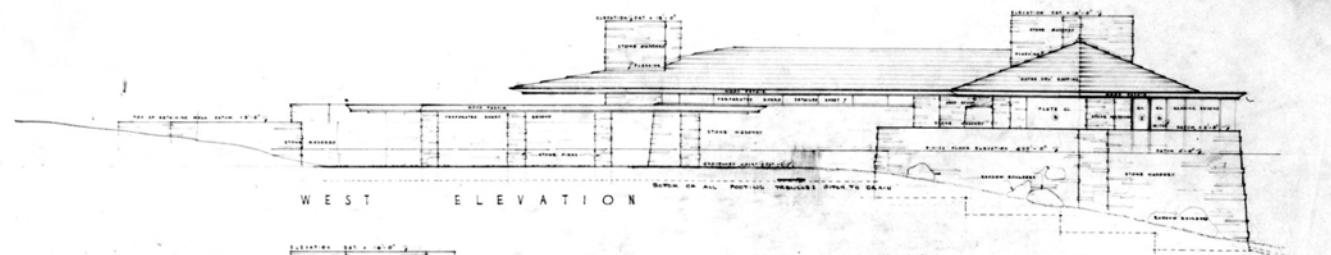


HOUSE FOR MR. AND MRS. I. N. HAGAN  
 BRICKTOWN PENNSYLVANIA  
 FRANK LLOYD WRIGHT

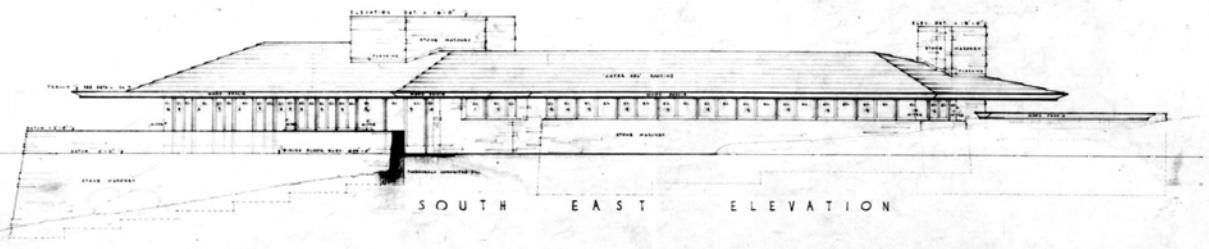
ARCHITECT  
 SHEET NO. 2  
 PLAN SHOWING LAYOUT OF  
 MASONRY WALLS, FLOORS, AND HEATING  
 SCALE 3/4" = 1'-0"



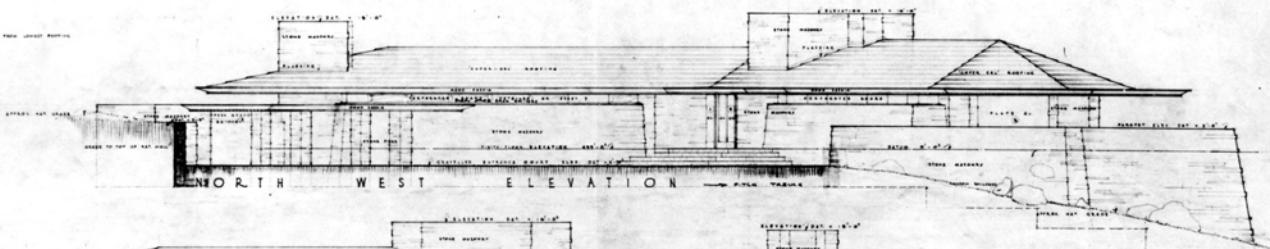




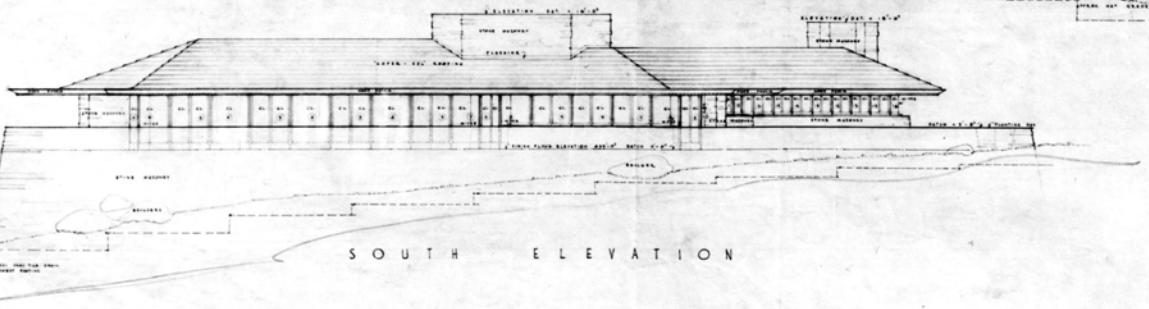
WEST ELEVATION



SOUTH EAST ELEVATION



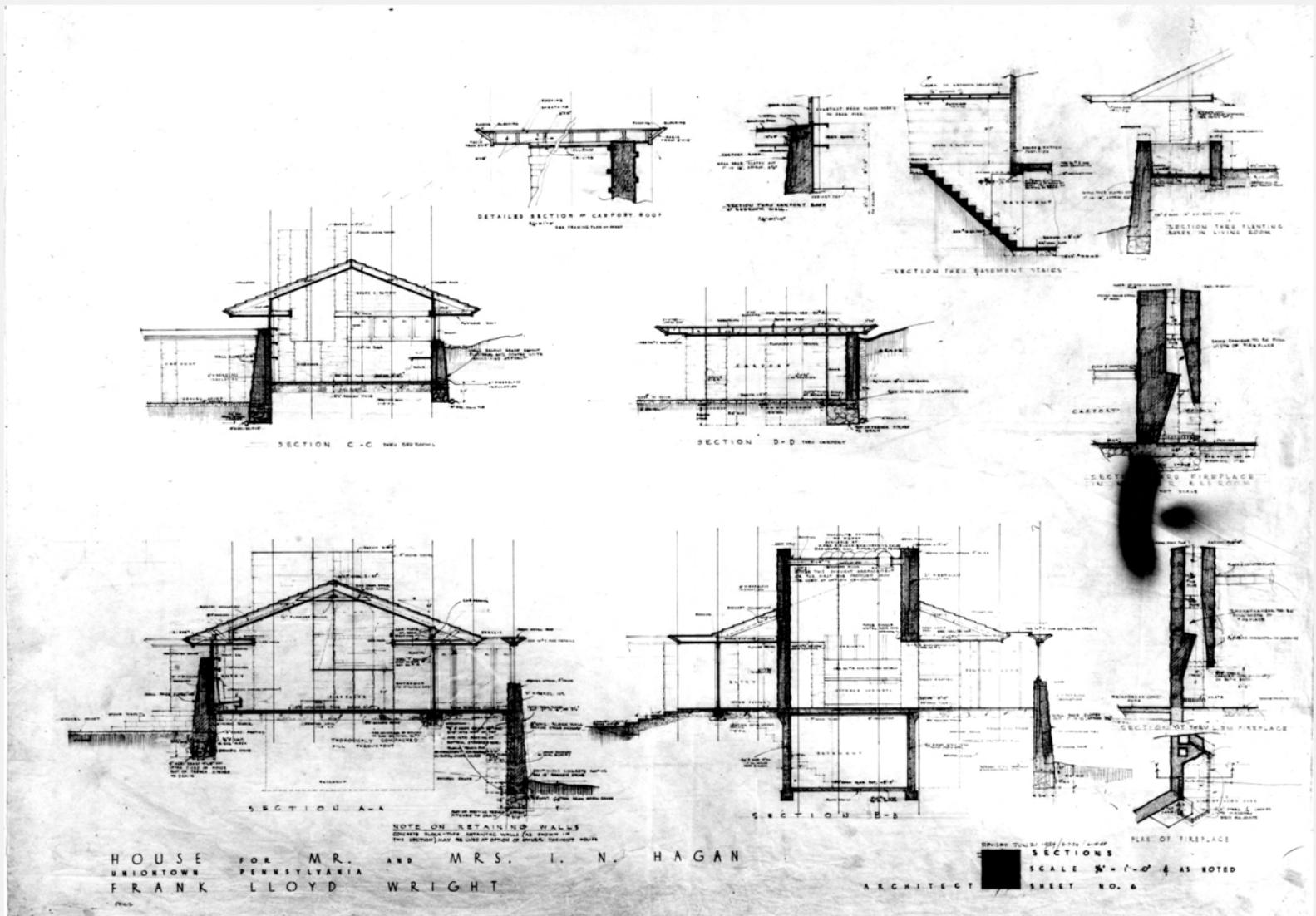
NORTH WEST ELEVATION



SOUTH ELEVATION

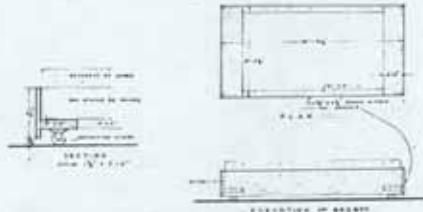
HOUSE FOR MR. AND MRS. I. N. HAGAN  
 UNIONTOWN, PENNSYLVANIA  
 FRANK LLOYD WRIGHT ARCHITECT

REVISED TO SHOW ELEVATIONS  
 SCALE 1/4" = 1' 0"  
 SHEET NO. 5

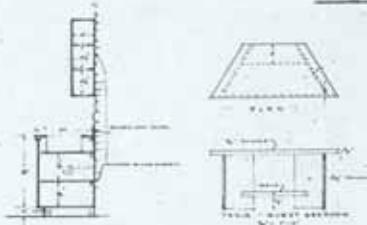




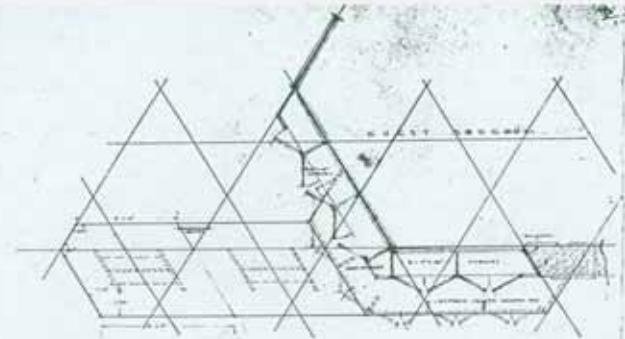
PLAN OF KITCHEN CABINETS, SCALE 1/8" = 1'-0"



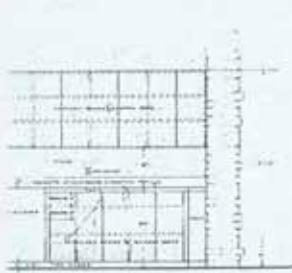
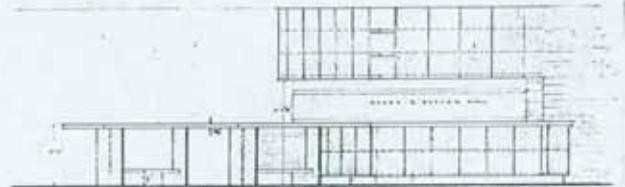
SECTION AND PLAN OF CABINET COMPONENT



SECTION AND PLAN OF CABINET COMPONENT



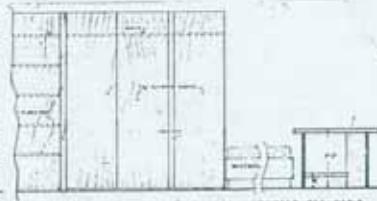
PLAN OF DINING TABLE & CABINETS, SCALE 1/8" = 1'-0"



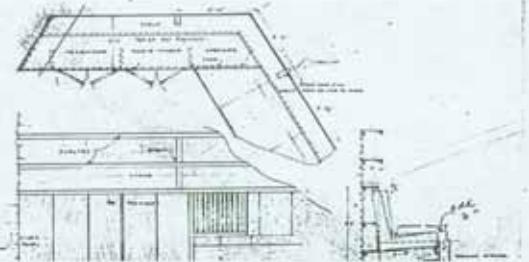
EXTERIOR ELEVATION S.E.



EXTERIOR ELEVATION N.W.



EXTERIOR ELEVATION W.



EXTERIOR ELEVATION E.

PLACEHOLDER  
FOR CABINET DETAILS SHEET

# PHOTO.GALLERIES

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UNIVERSITY  
ARCHITECTURE

F. L. WRIGHT'S HOUSE FOR I. N. HAGAN, CHALK HILL, PA 1953 - 1956  
**KENTUCK KNOB**  
PRECEDENT :: ANALYSIS :: TRANSFORMATION



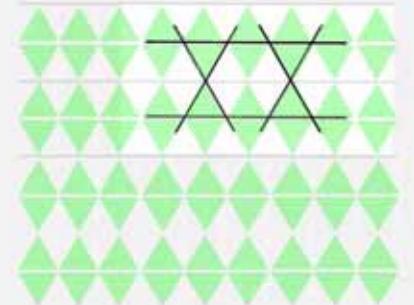
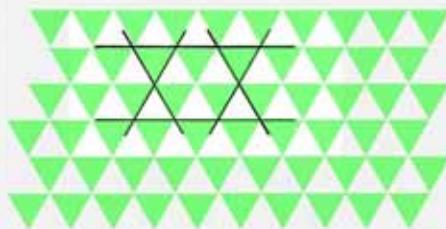
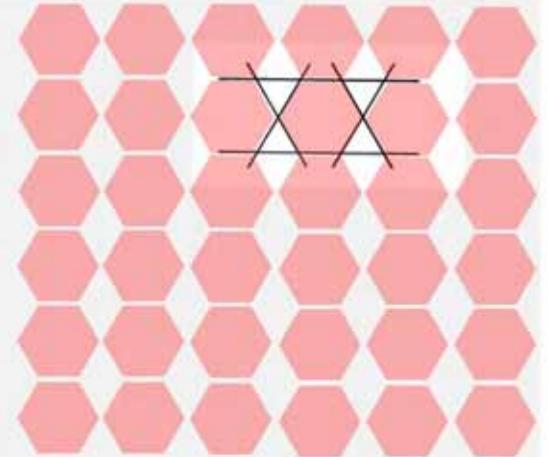
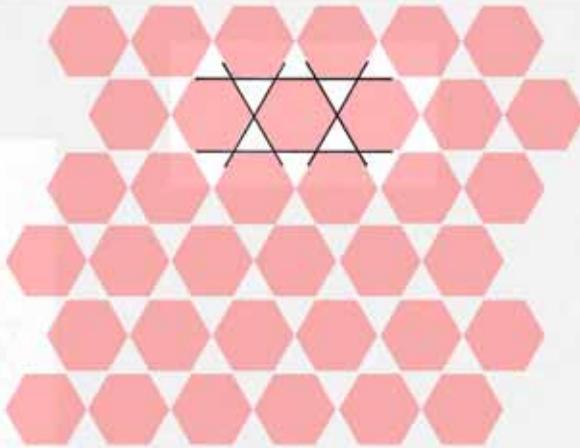
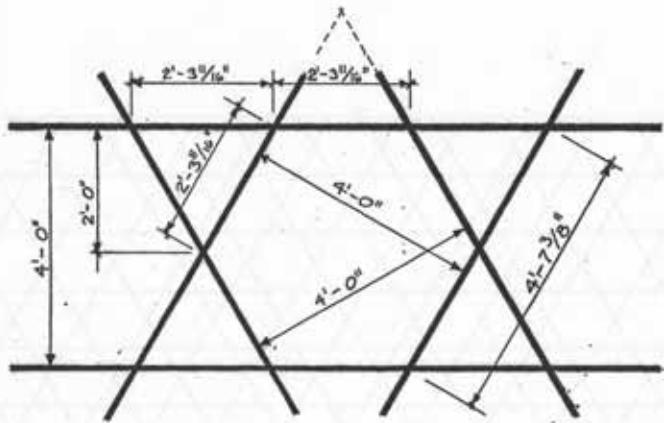






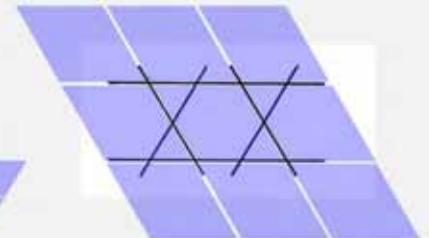
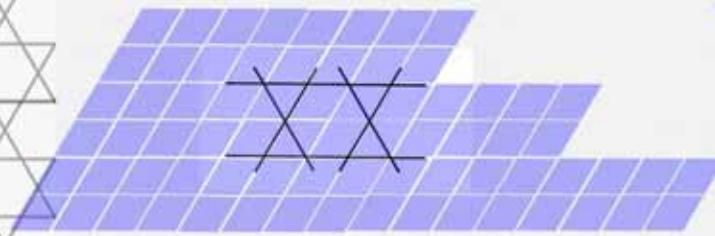
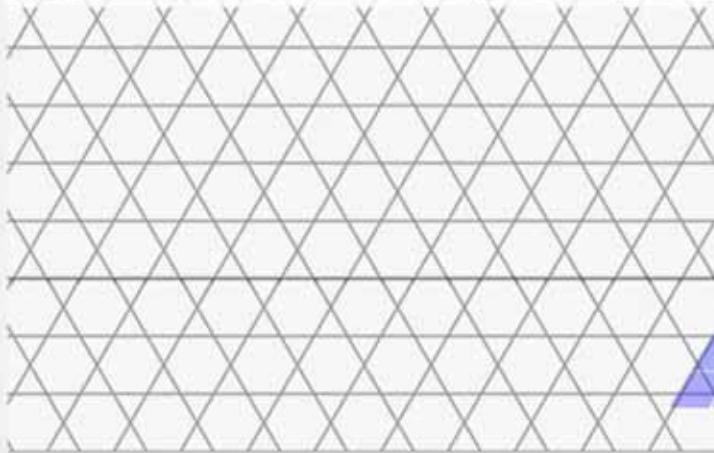
# ANALYSIS

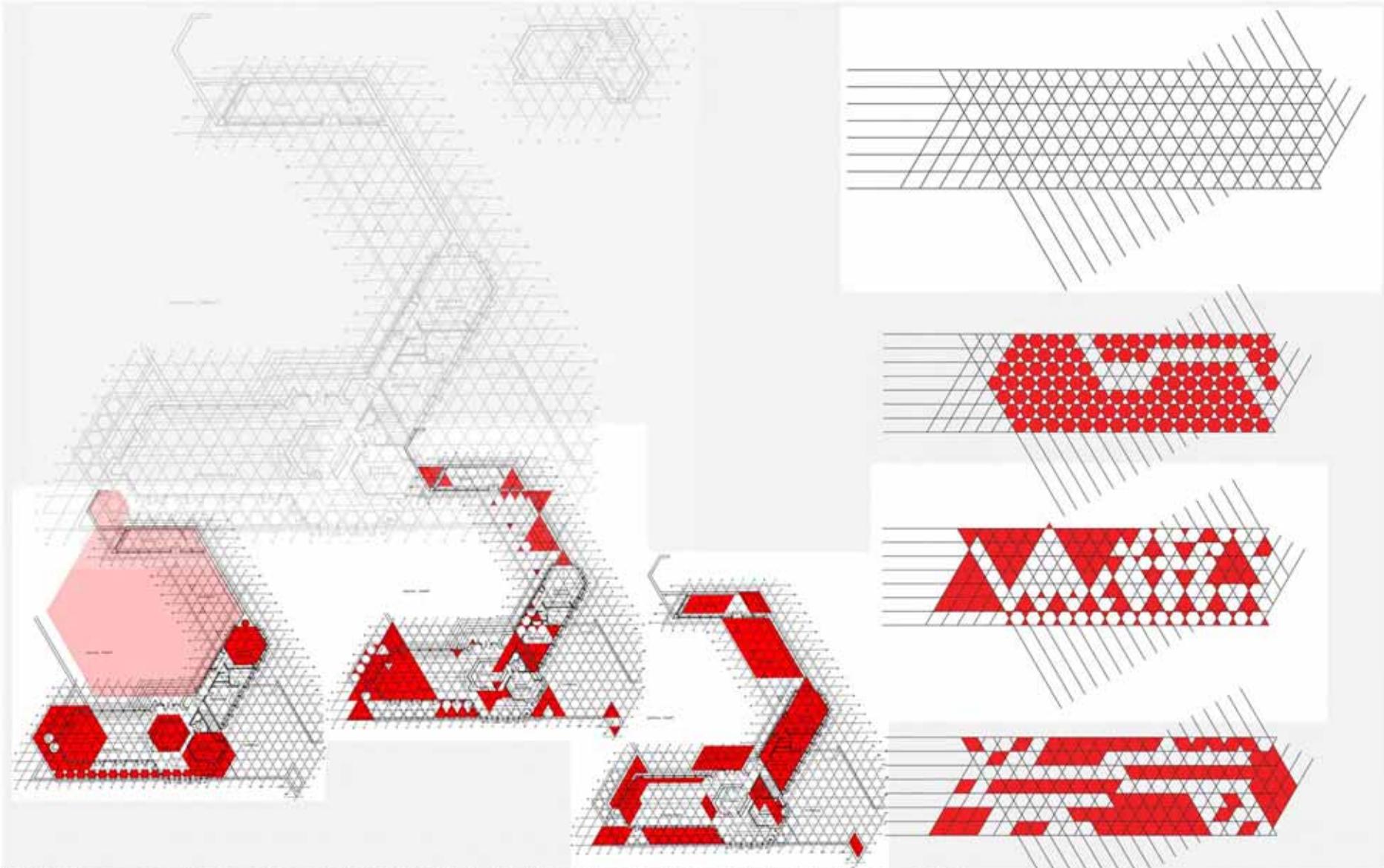
:: PLAN AND UNIT SYSTEM

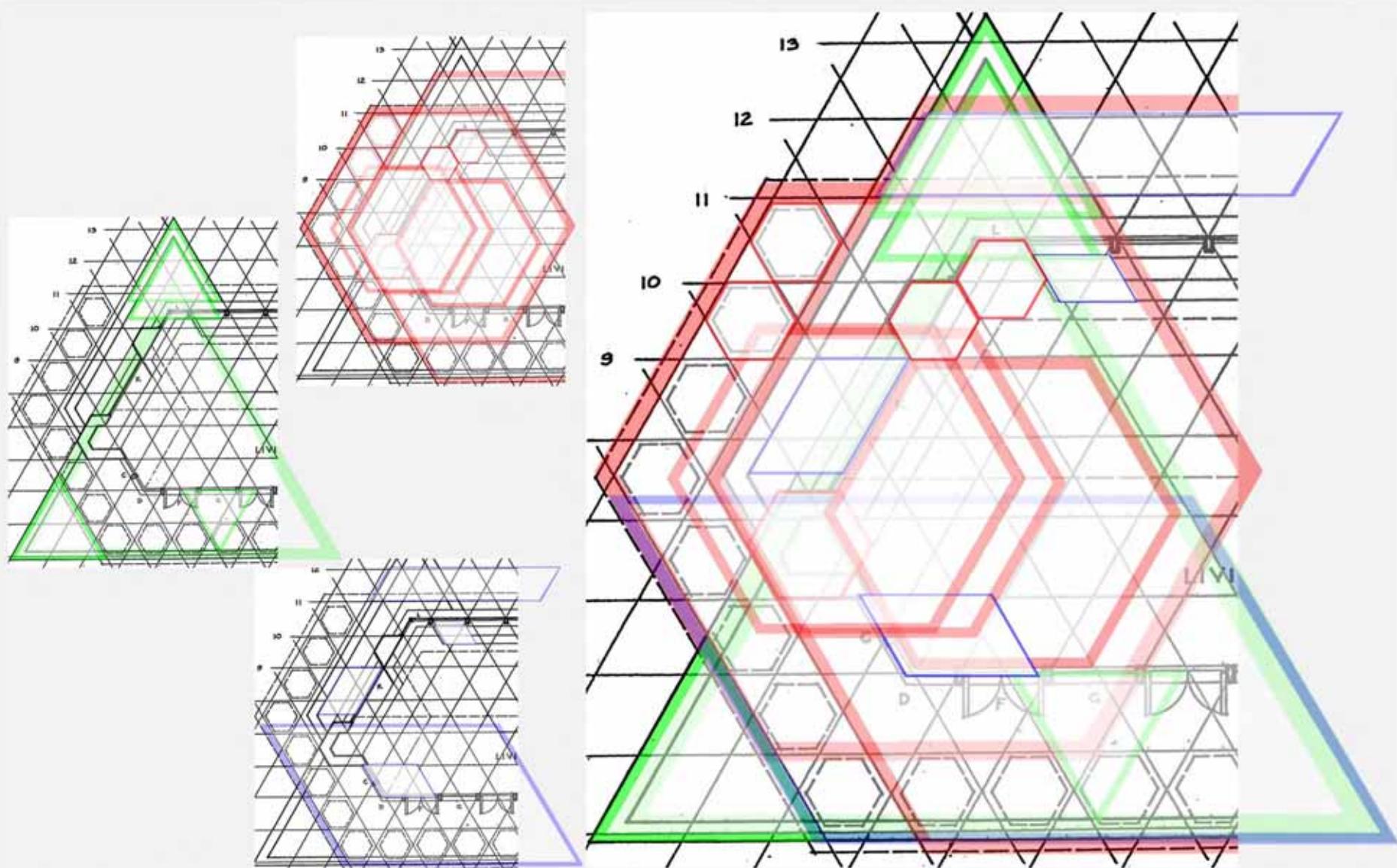


UNIT SYSTEM

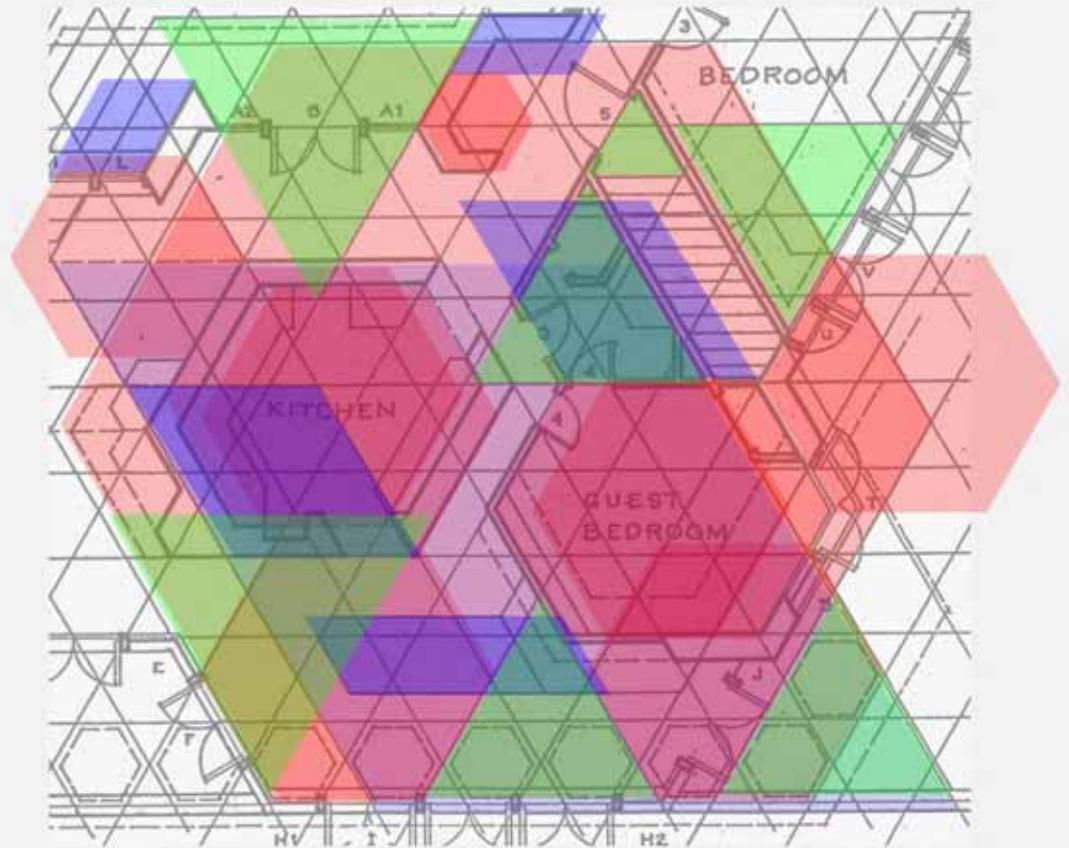
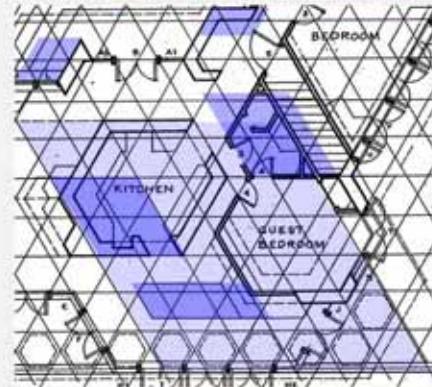
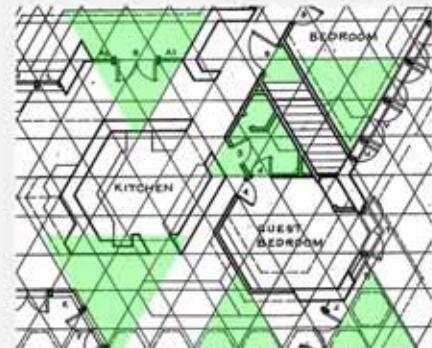
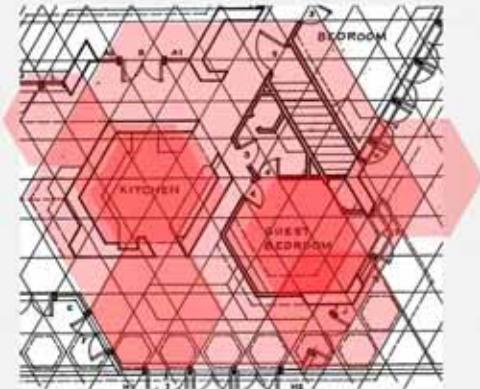
$\frac{1}{2}'' = 1'-0''$

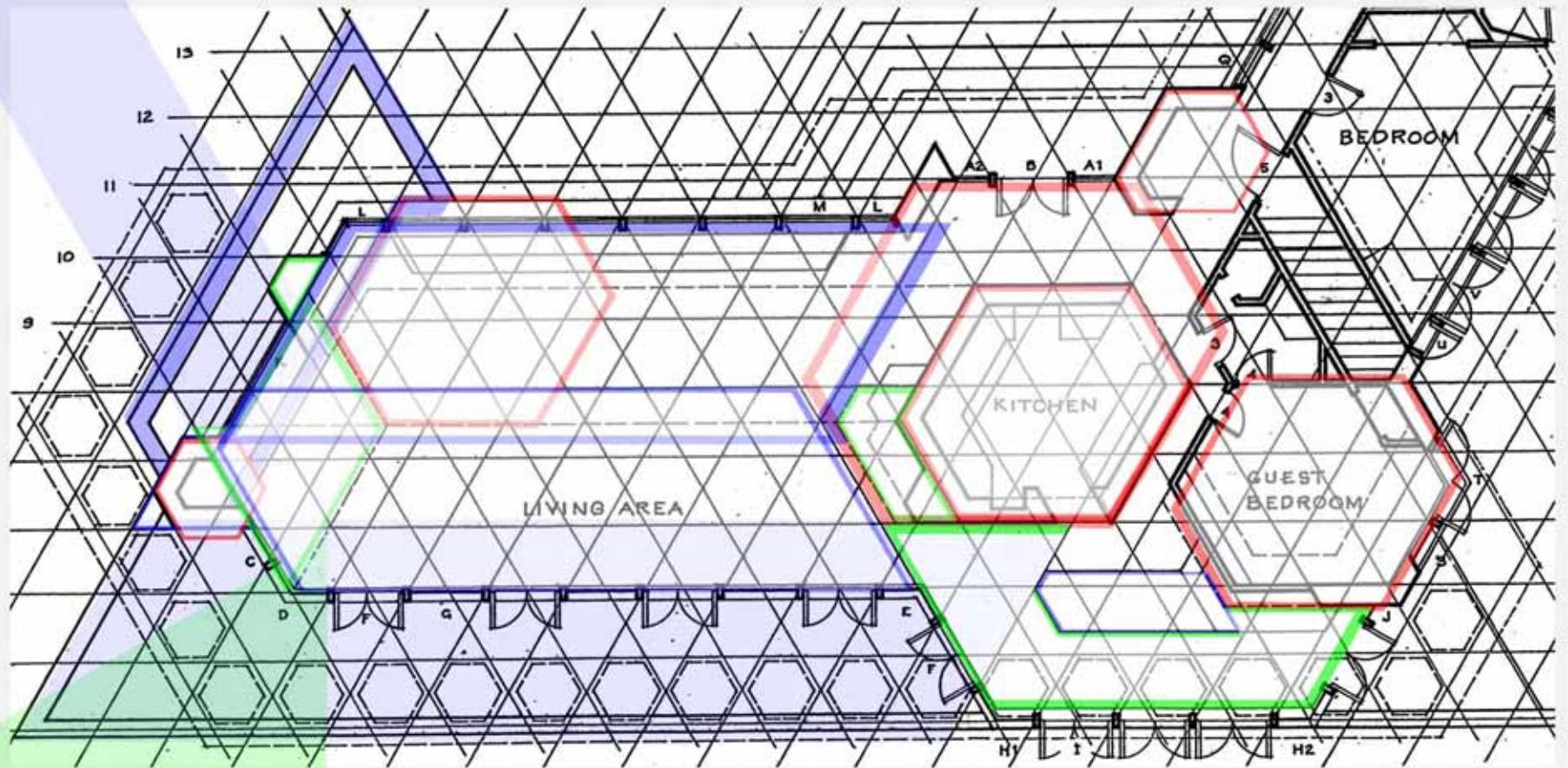


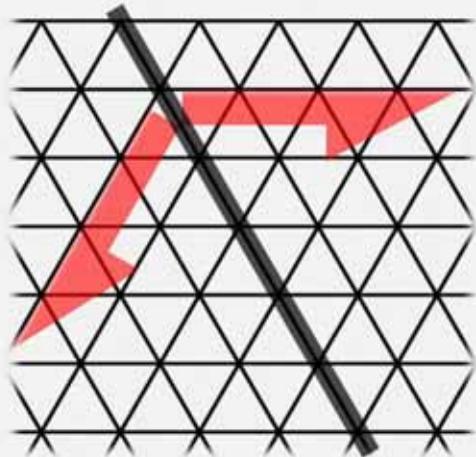




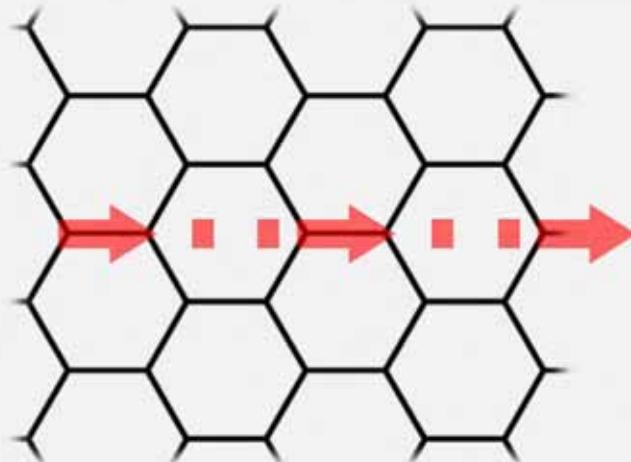
CARNEGIE MELLON UNIVERSITY ARCHITECTURE | FLWRIGHT'S HOUSE FOR I. N. HAGAN, CHALK HILL, PA 1953-1956 | PRECEDENT :: ANALYSIS :: TRANSFORMATION | **KENTUCK KNOB** | REGULAR PLAN GEOMETRIES | **D3**



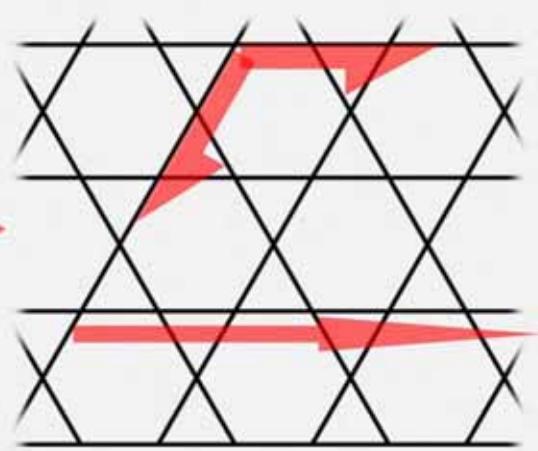




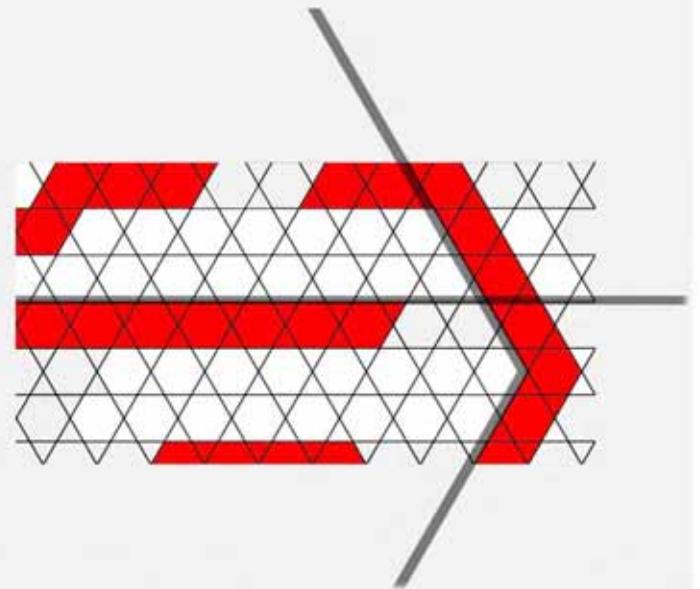
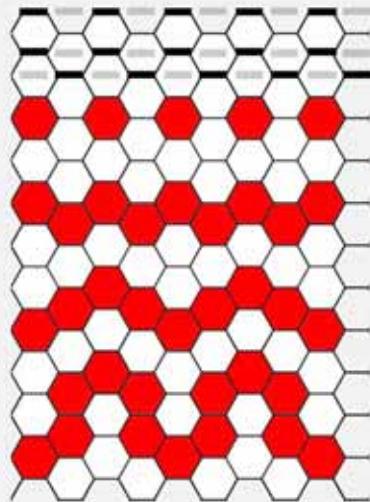
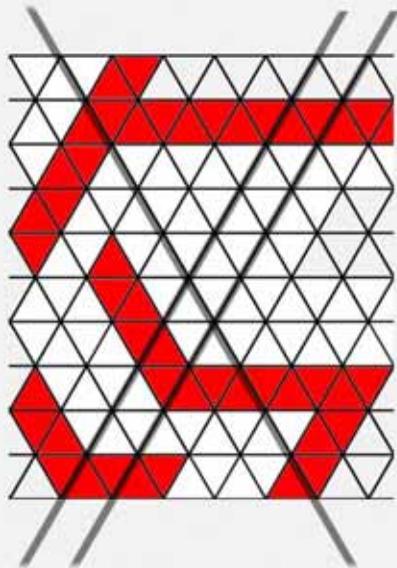
STANDARD TRIANGLE  
GRID

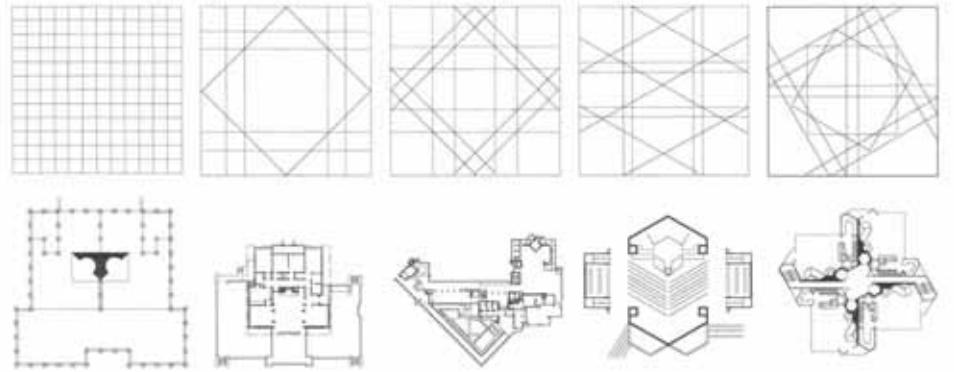
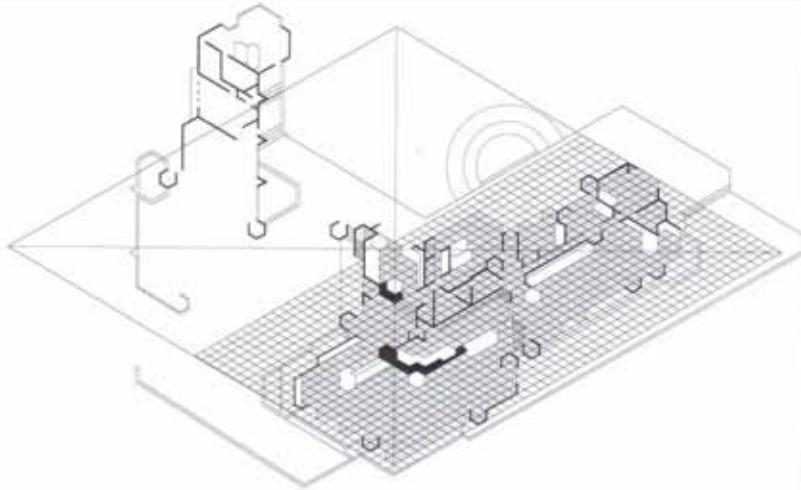


STANDARD HEXAGON  
GRID



HAGAN "STAR" GRID





B

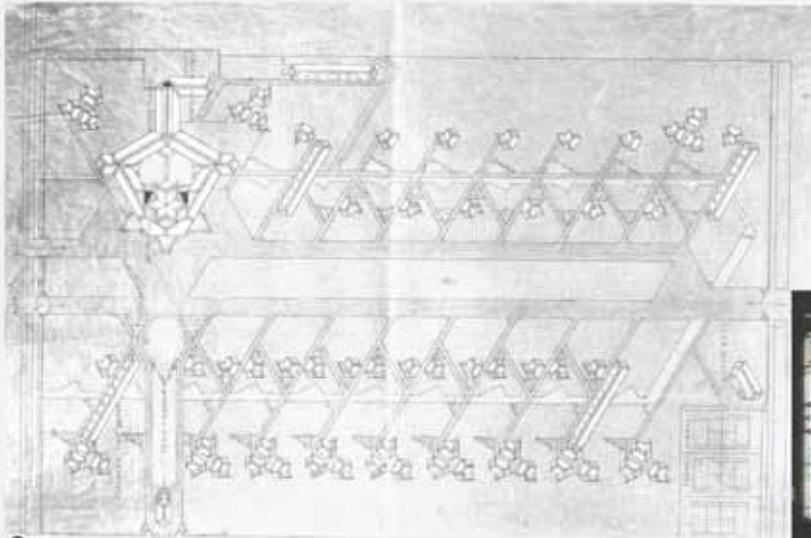
A: HANNA HOUSE (1936)  
PLAN DIAGRAM WITH 30-60 GRID IMPOSED

B (FROM LEFT): GERTS SUMMER COTTAGE [1902], CHENEY HOUSE [1903], TALIESIN WEST [1937], PFEIFFER CHAPEL [1938] ST MARKS TOWER [1925]

C: SAN MARCOS GARDENS [1928]

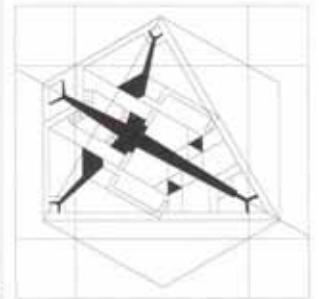
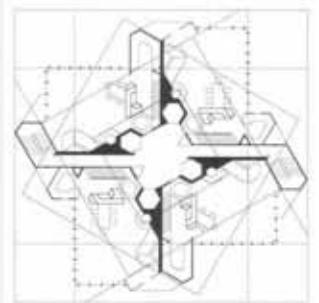
D: ROBIE HOUSE

E (TOP TO BOTTOM): ST MARKS TOWER [1925], JOHNSON RESEARCH TOWER [1944]



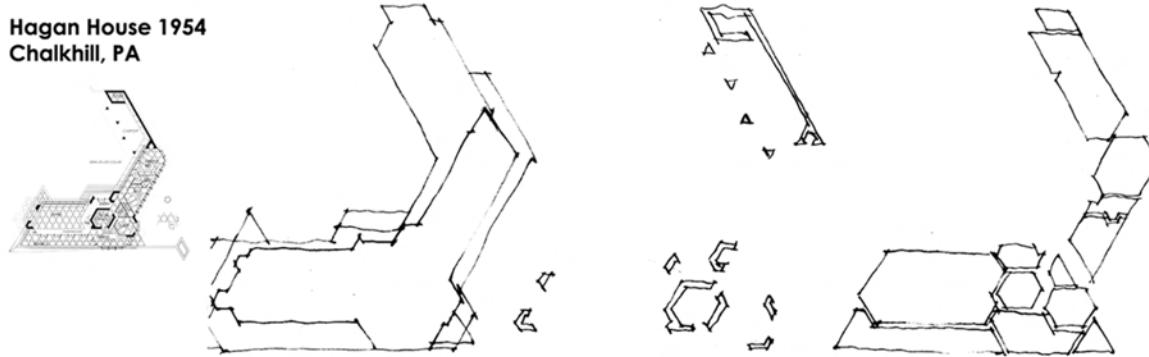
C

D

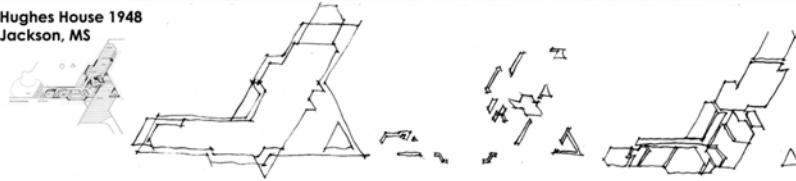


E

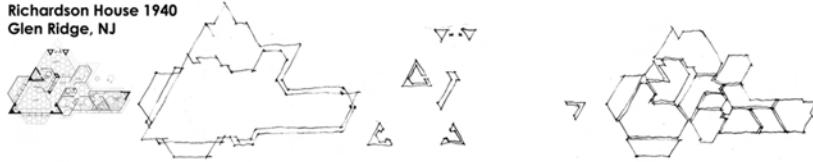
Hagan House 1954  
Chalkhill, PA



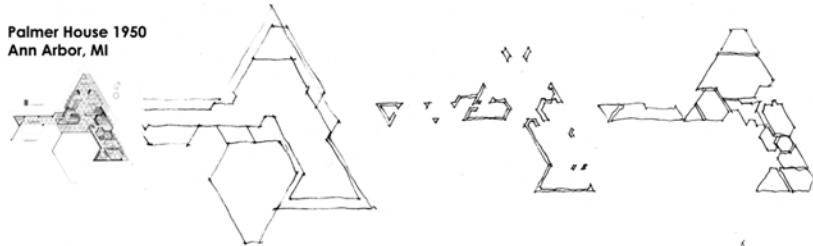
Hughes House 1948  
Jackson, MS



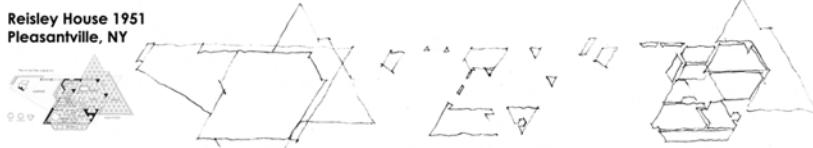
Richardson House 1940  
Glen Ridge, NJ



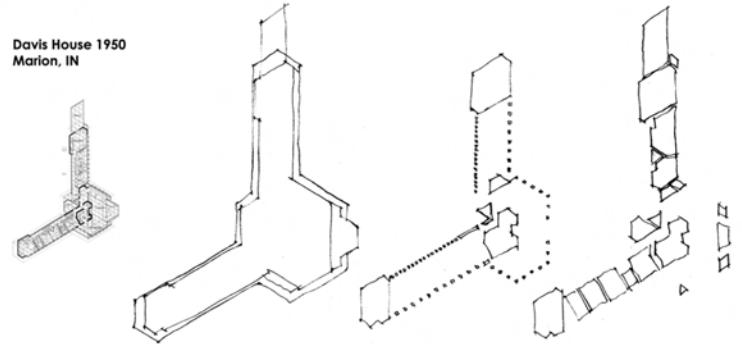
Palmer House 1950  
Ann Arbor, MI



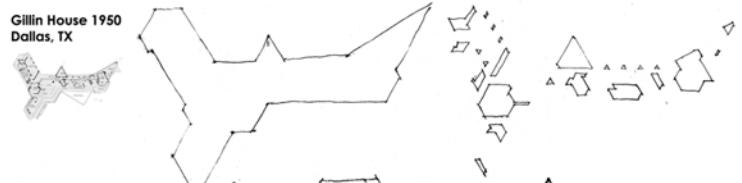
Reisley House 1951  
Pleasantville, NY



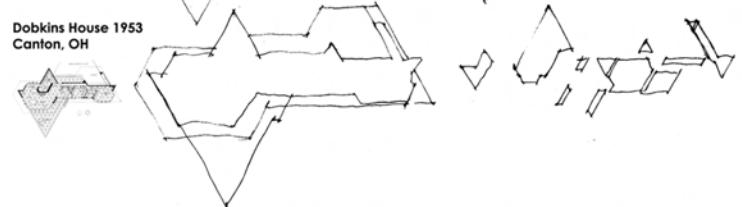
Davis House 1950  
Marion, IN



Gillin House 1950  
Dallas, TX

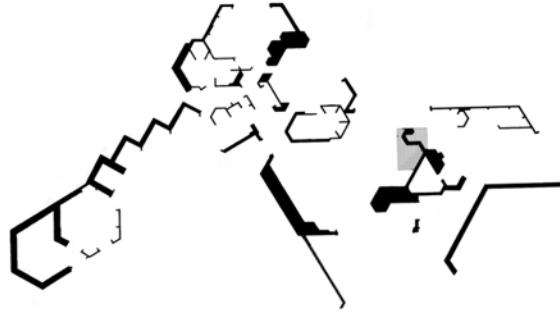


Dobkins House 1953  
Canton, OH

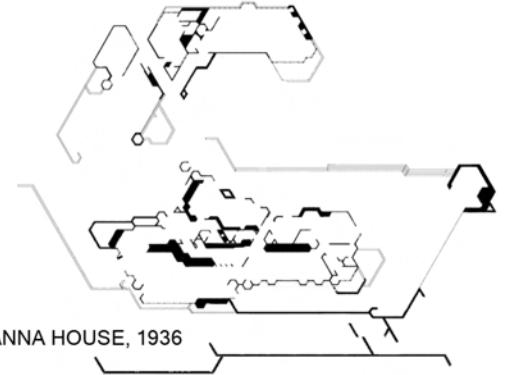




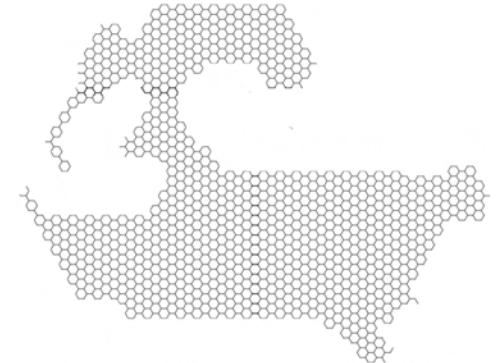
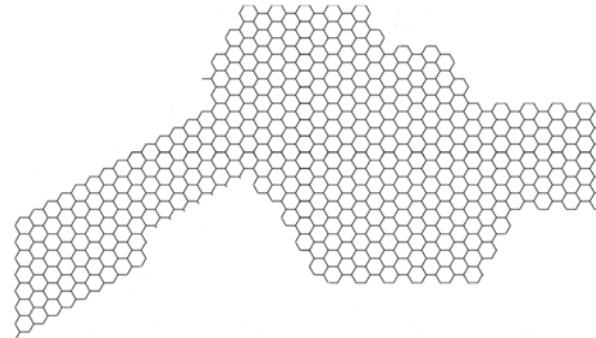
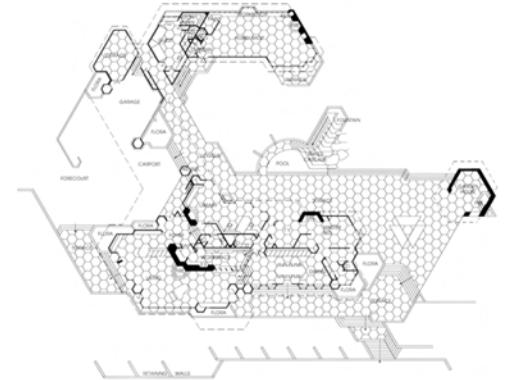
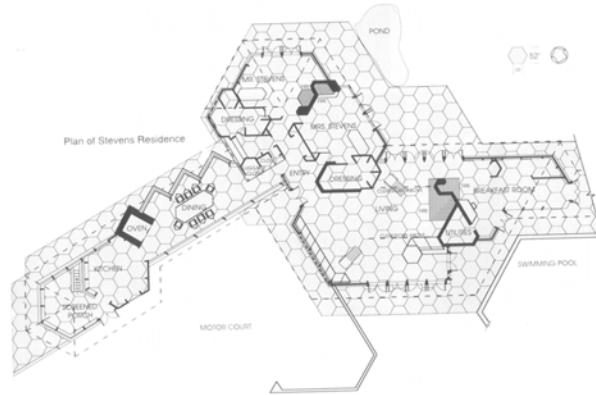
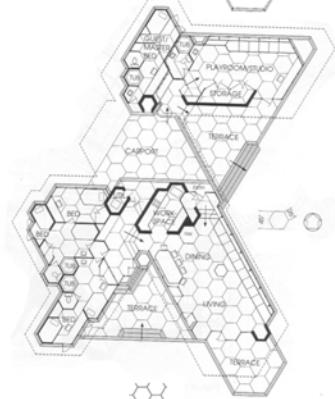
BAZETT HOUSE, 1939



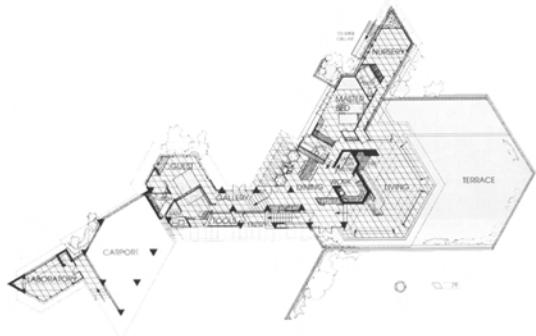
AULDBRESS, 1939



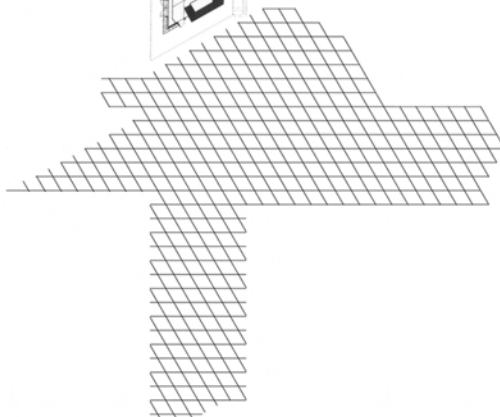
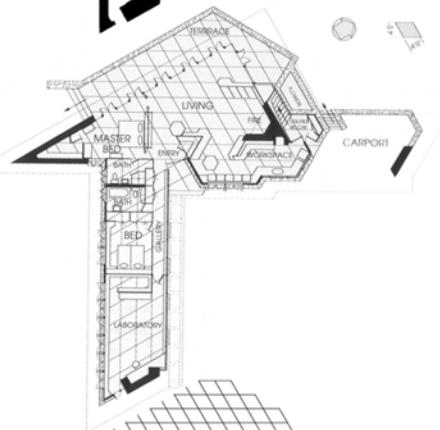
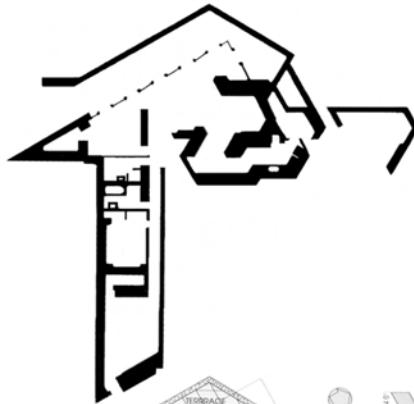
HANNA HOUSE, 1936



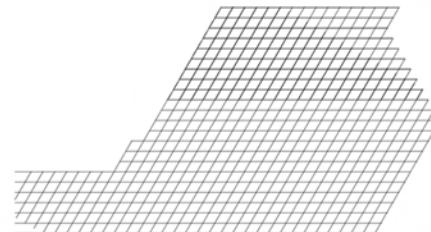
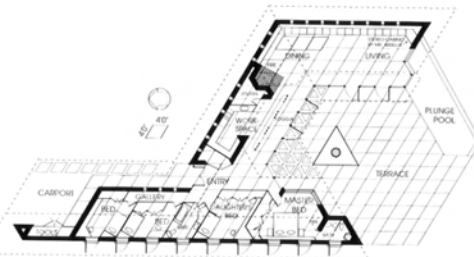
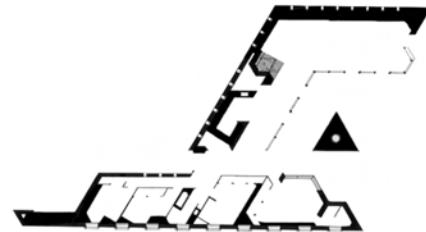
WALL HOUSE . 1954



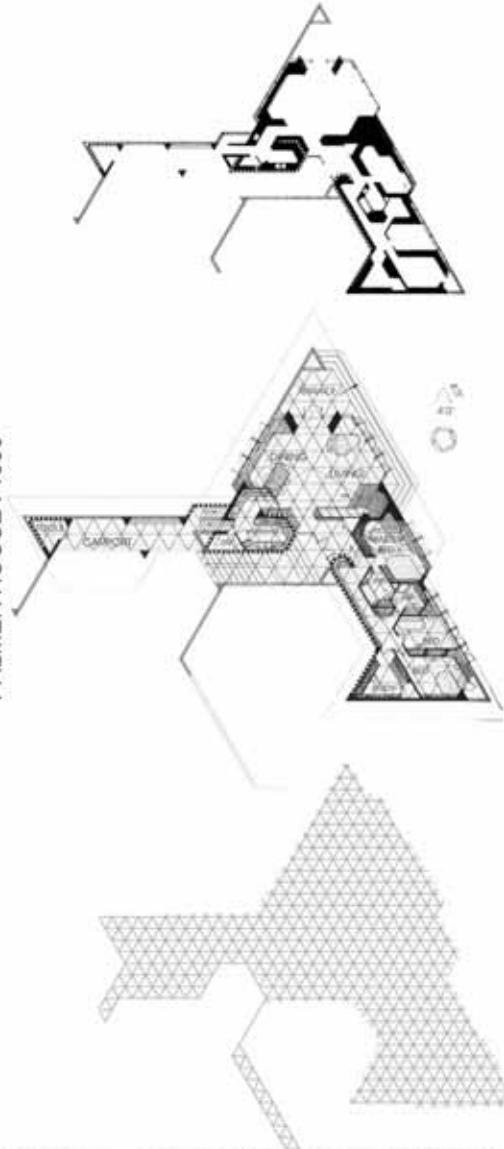
ANTHONY HOUSE . 1949



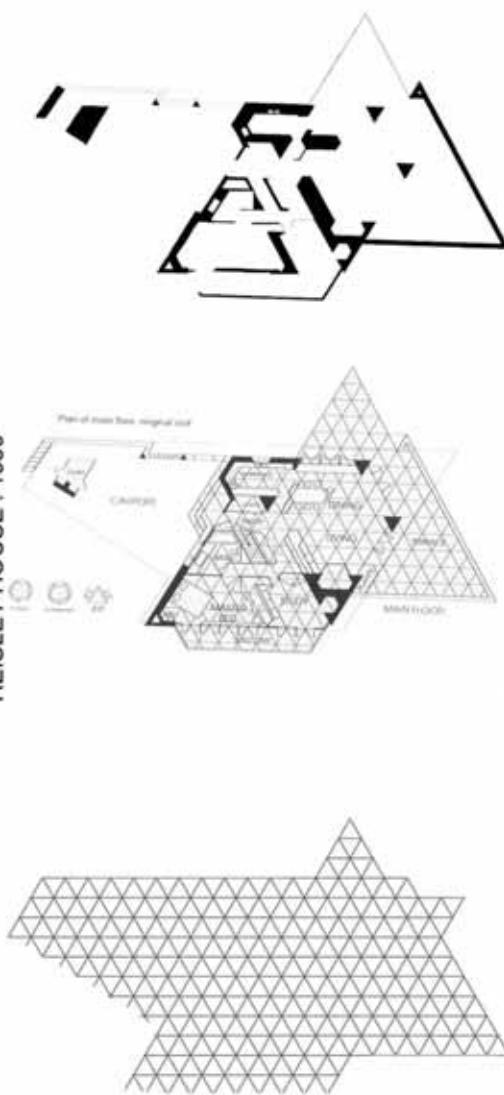
ROBERT SMITH HOUSE . 1950



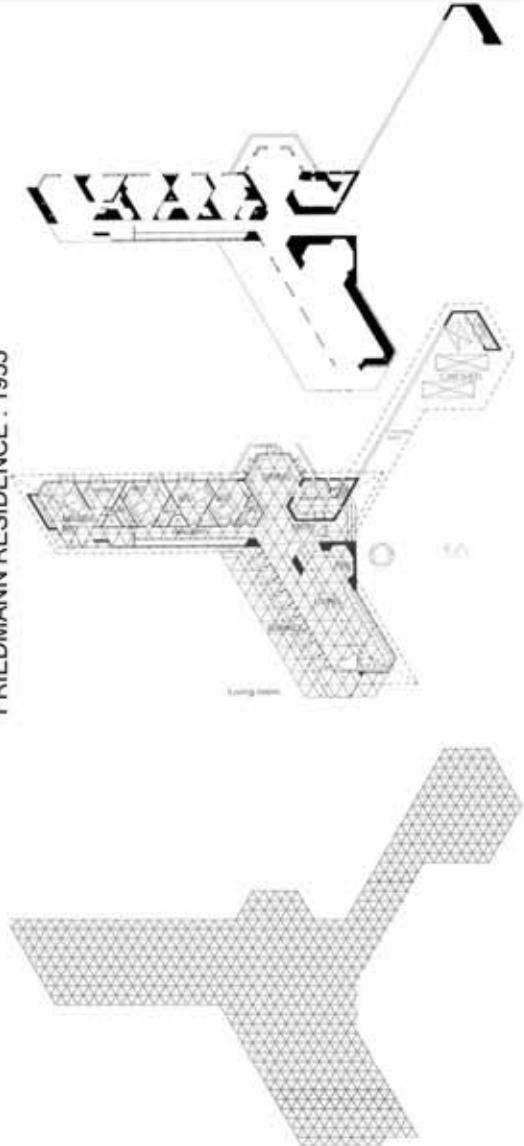
PALMER HOUSE . 1950



REISLEY HOUSE . 1950



FRIEDMANN RESIDENCE . 1955





PURE HEXAGONAL GRID

HANNA HOUSE . 1938 [PICTURED]  
AULDBRASS . 1938  
BAZETT RESIDENCE . 1939  
RICHARDSON RESIDENCE . 1940



STAR GRID

KENTUCKY KNOB . 1954



PARALLELOGRAM (DIAMOND) GRID

WALL RESIDENCE . 1941  
FRIEDMAN VACATION LODGE . 1945  
MCCARTNEY RESIDENCE . 1949  
HUGHES RESIDENCE . 1948  
WALKER RESIDENCE . 1948 [PICTURED]  
ANTHONY RESIDENCE . 1949  
DAVID RESIDENCE . 1950  
BERGER RESIDENCE . 1950  
MATHEWS RESIDENCE . 1950  
RICHARD SMITH RESIDENCE . 1950  
GILLIN RESIDENCE . 1950  
KRAUS RESIDENCE . 1951  
PATRICK KINNEY RESIDENCE . 1951  
TEATER STUDIO RESIDENCE . 1952  
COOKE RESIDENCE . 1953  
BOOMER RESIDENCE . 1953  
ARNOLD RESIDENCE . 1954  
THAXTON RESIDENCE . 1954  
OLFELT RESIDENCE . 1958  
ALBIN RESIDENCE . 1958  
STROMQUIST RESIDENCE . 1958



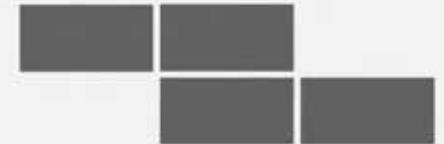
TRIANGLE GRID

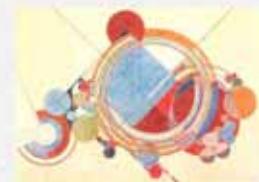
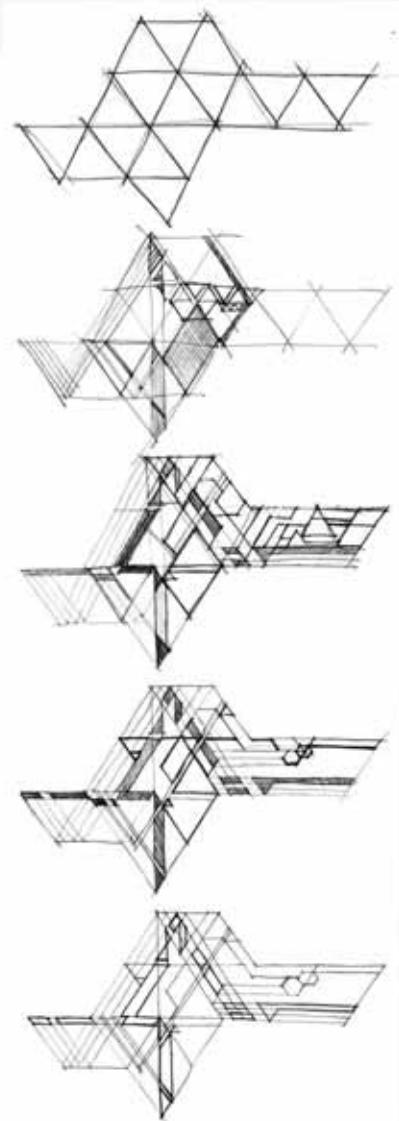
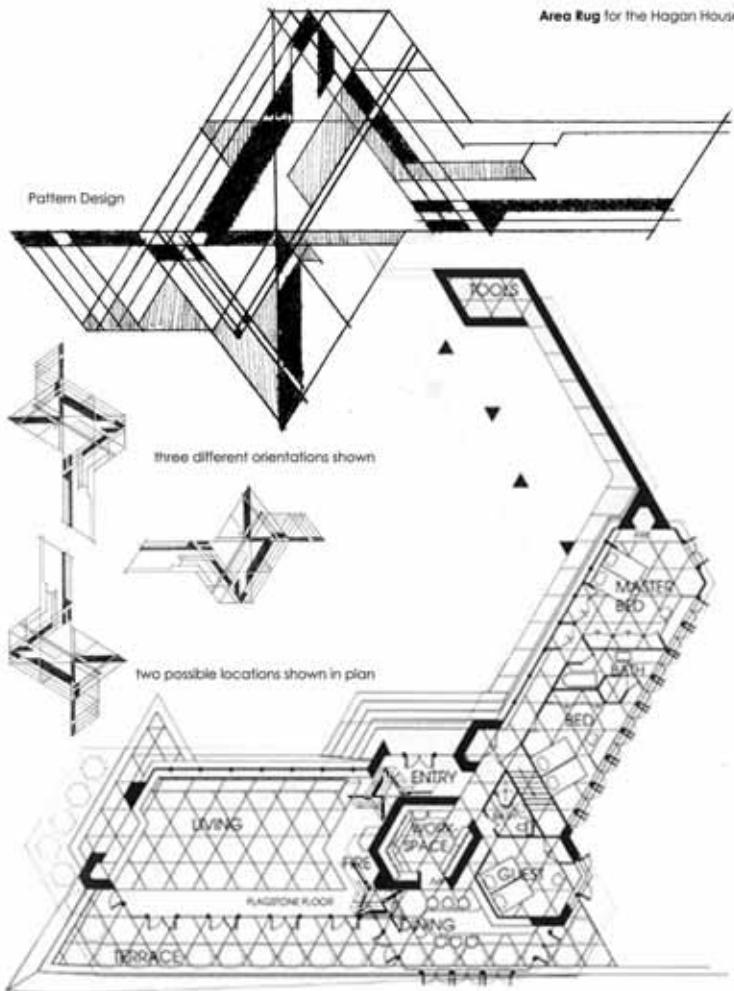
PALMER RESIDENCE . 1950  
REISLEY RESIDENCE . 1951  
DOBKINS RESIDENCE . 1953  
FAWCETT RESIDENCE . 1955 [PICTURED]  
ALLEN FRIEDMAN RESIDENCE . 1956



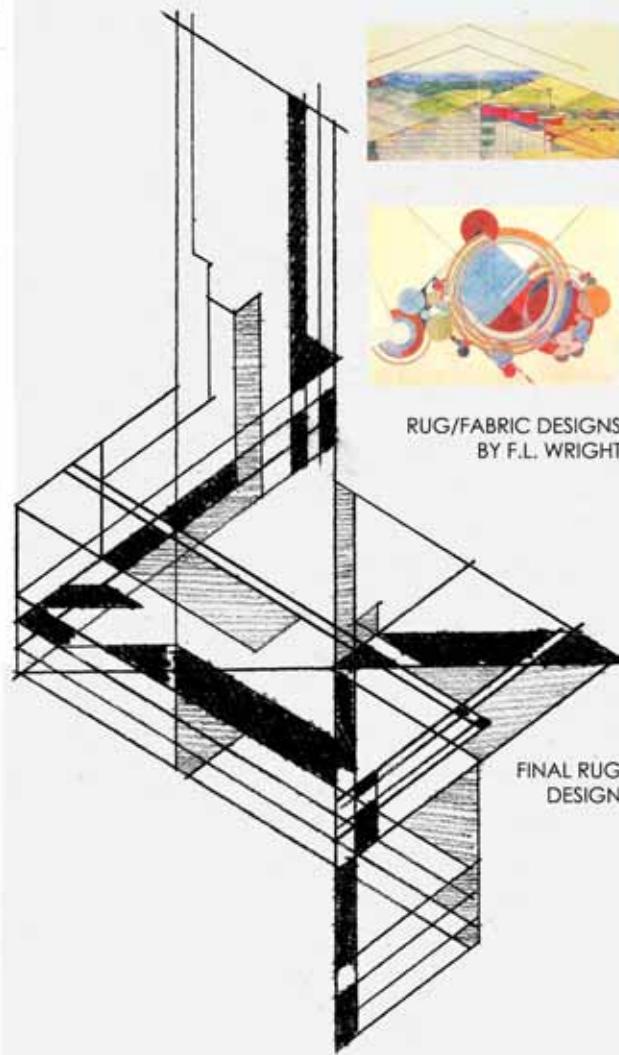
RECTANGLE GRID

JACOBS HOUSE I . 1936  
ROSENBAUM HOUSE . 1939  
POPE-LEIGHEY HOUSE . 1939  
EUCHTMAN RESIDENCE . 1939  
BAIRD RESIDENCE . 1940  
CHRISTIE RESIDENCE . 1940  
M.M. SMITH . 1946  
WELTZHEIMER RESIDENCE . 1948  
RUBIN RESIDENCE . 1951  
SANDER RESIDENCE . 1952



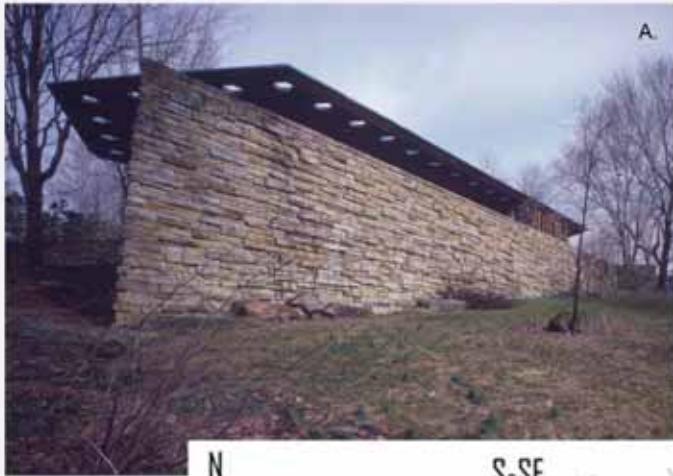


RUG/FABRIC DESIGNS  
BY F.L. WRIGHT

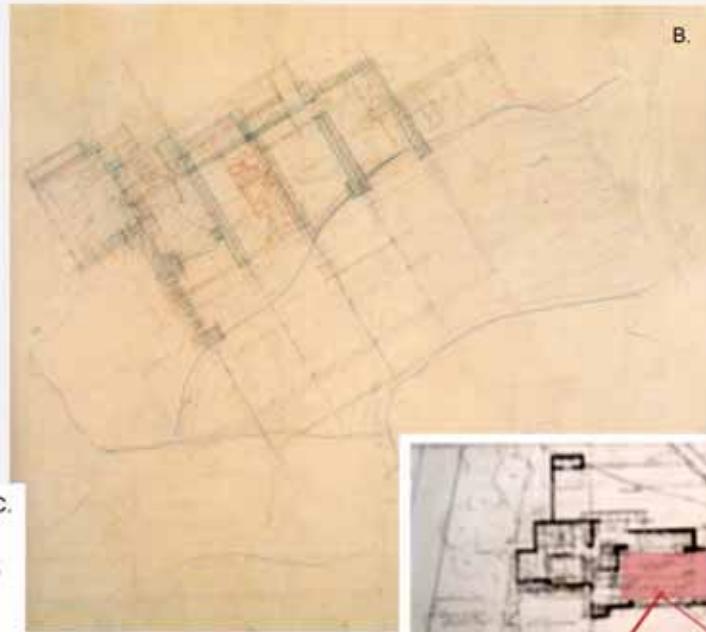


# SITING.APPROACH.PROMENADE

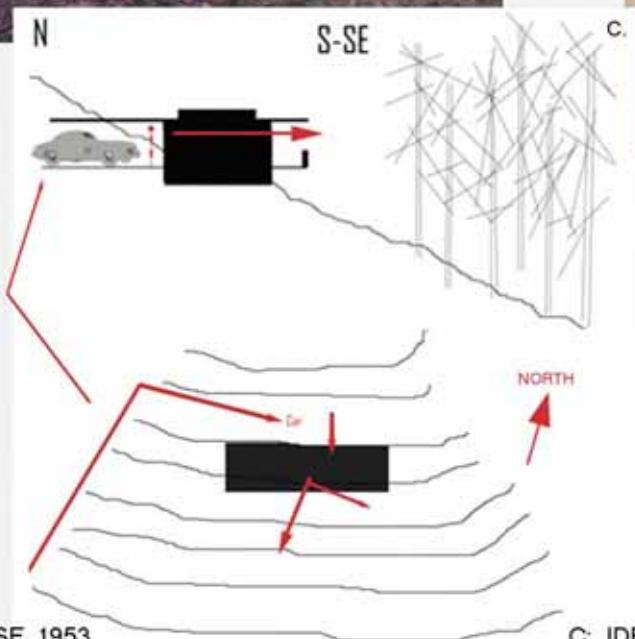
:: ANALYSIS



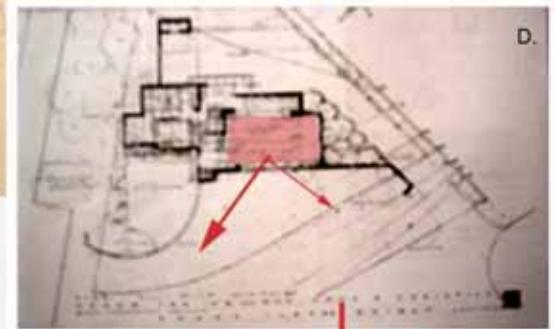
A.



B.



C.



D.

MIRROR AND ROTATE

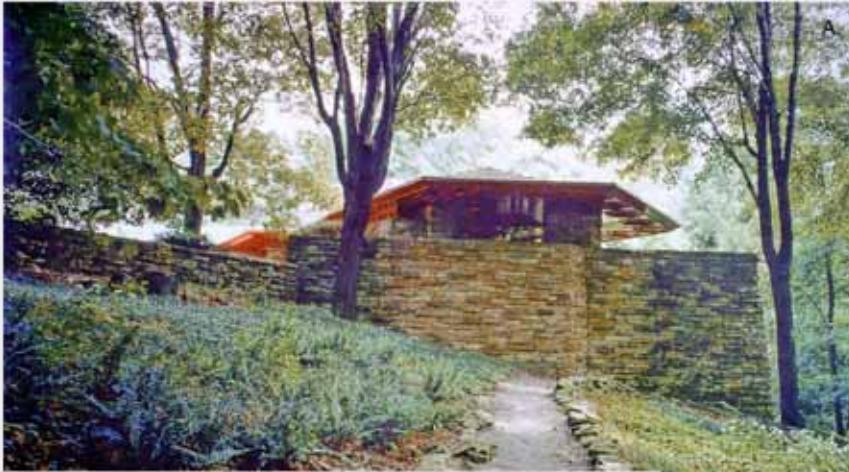


A: HAGAN HOUSE, 1953

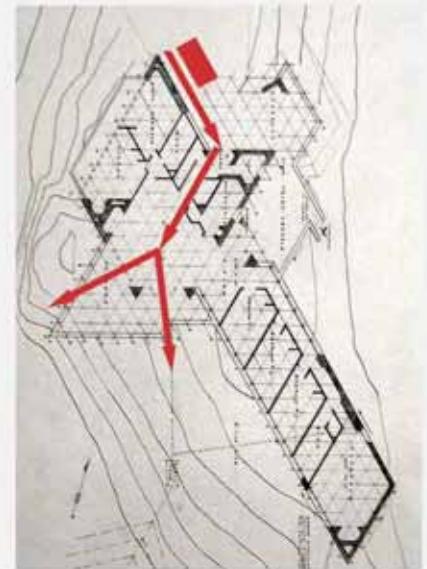
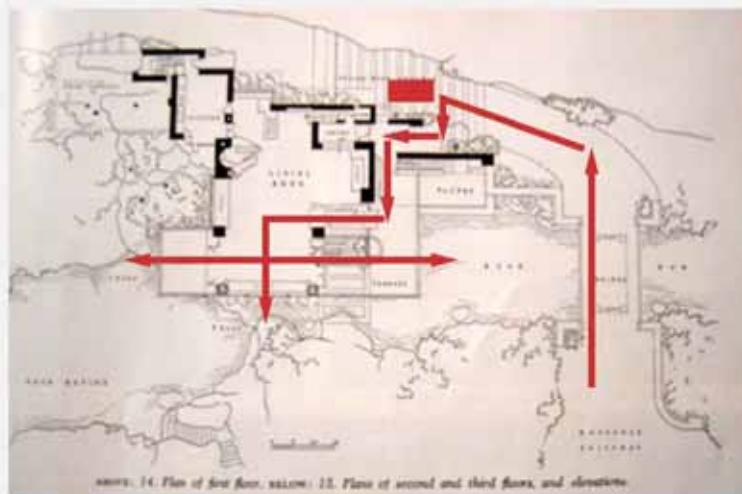
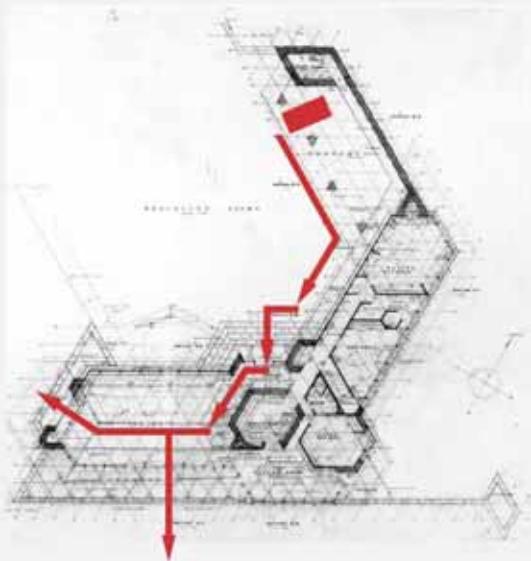
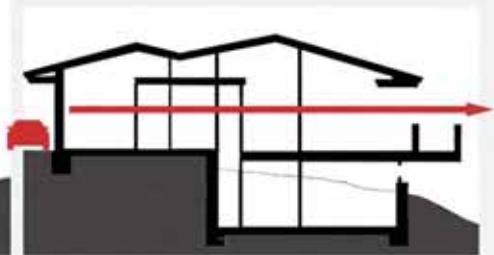
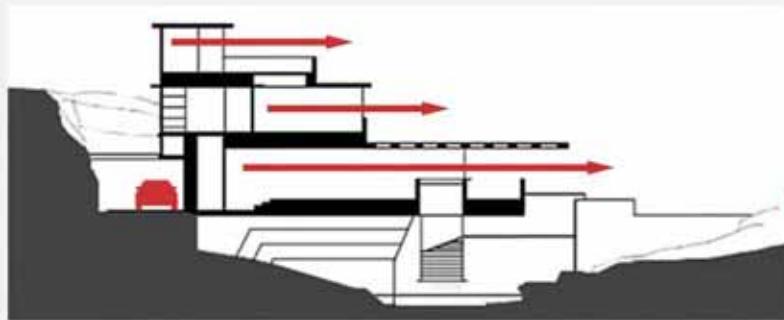
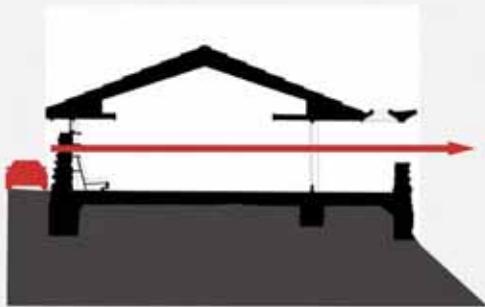
B: FALLINGWATER ORIGINAL PLAN, 1935

C: IDEAL SITING DIAGRAM

D: SAMARA, 1954



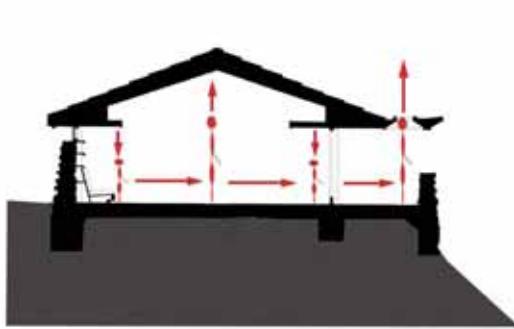
A: HAGAN HOUSE, 1953  
 B: WALL HOUSE, 1941  
 C: ARCH OBOLER HOUSE, UNBUILT  
 D: FALLINGWATER, 1934  
 E: REISLEY HOUSE, 1951  
 F: UNITARIAN CHURCH, 1947  
 G: FRIEDMAN HOUSE, 1948  
 H: POINT VIEW APARTMENTS, UNBUILT



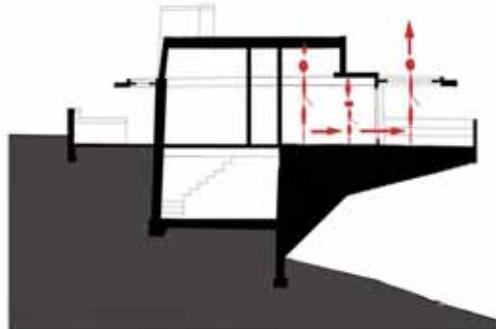
HAGAN HOUSE, 1953

FALLINGWATER, 1934

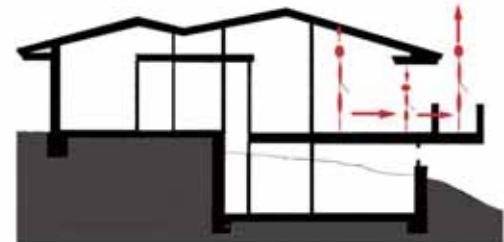
REISLEY HOUSE, 1951



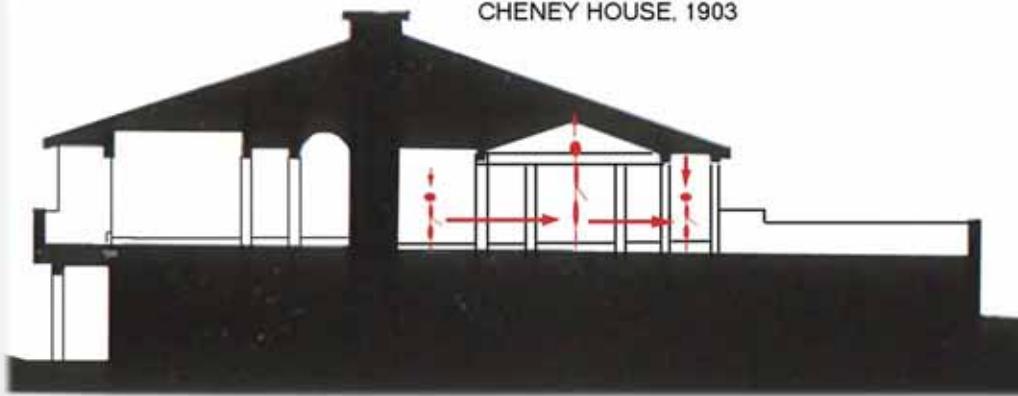
HAGAN HOUSE, 1953



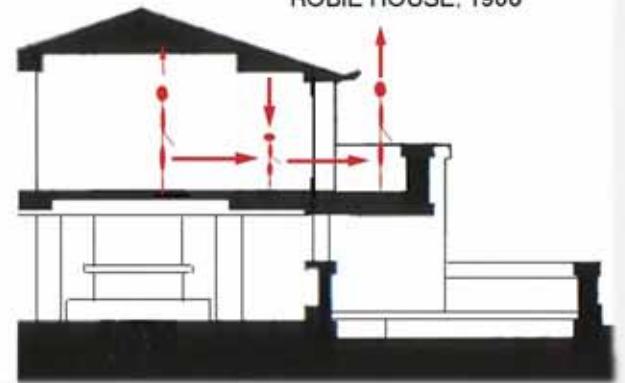
SWAN RESIDENCE, 1953



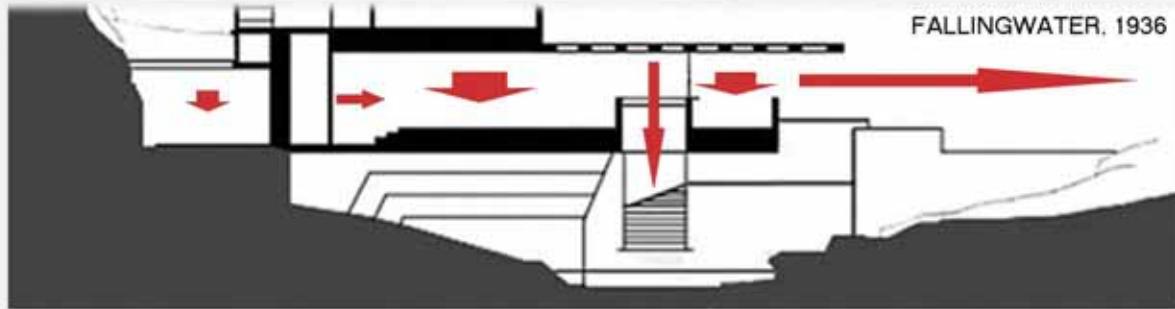
REISLEY HOUSE, 1951



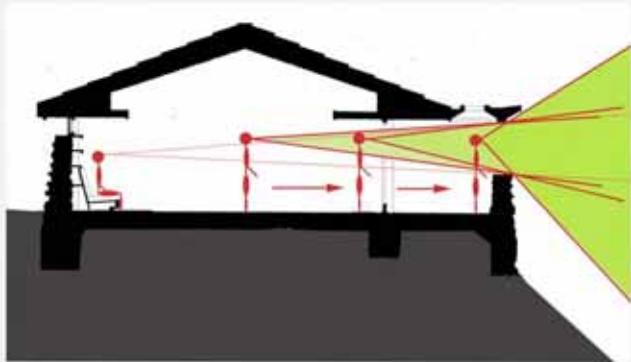
CHENEY HOUSE, 1903



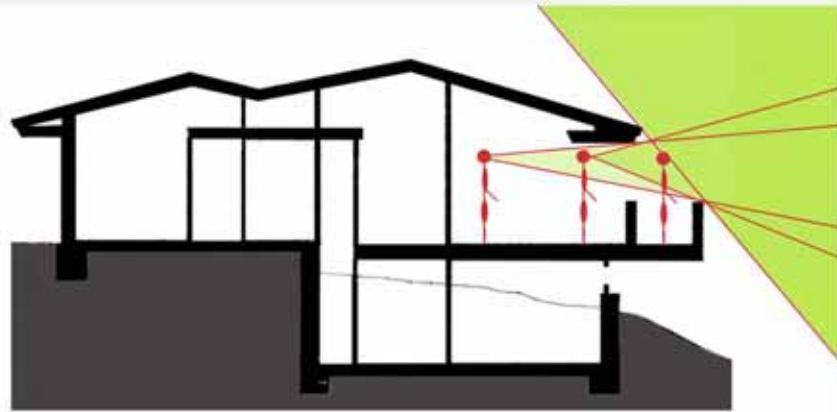
ROBIE HOUSE, 1906



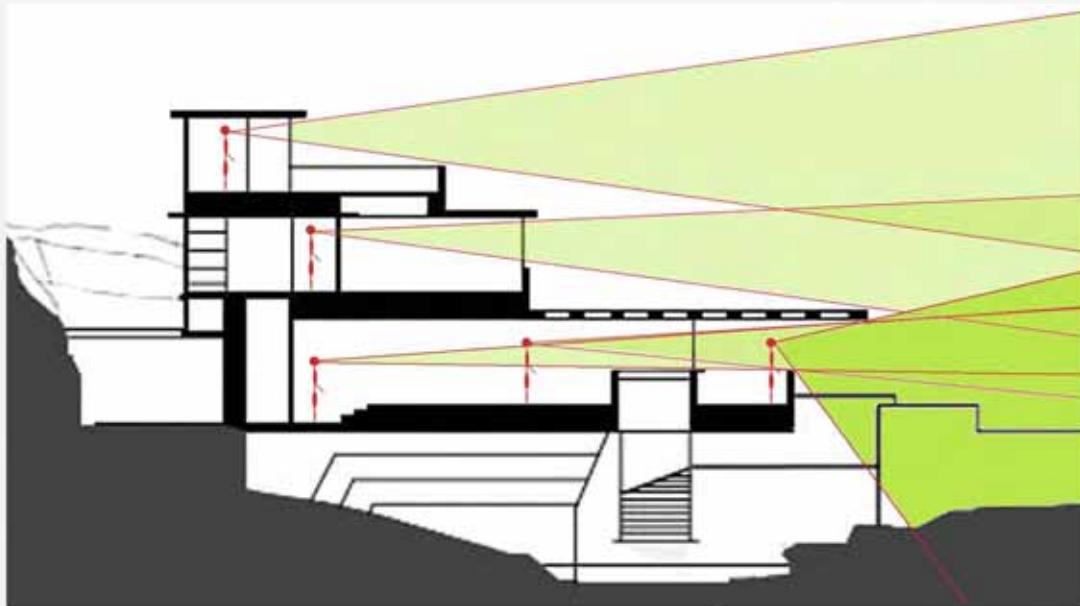
FALLINGWATER, 1936



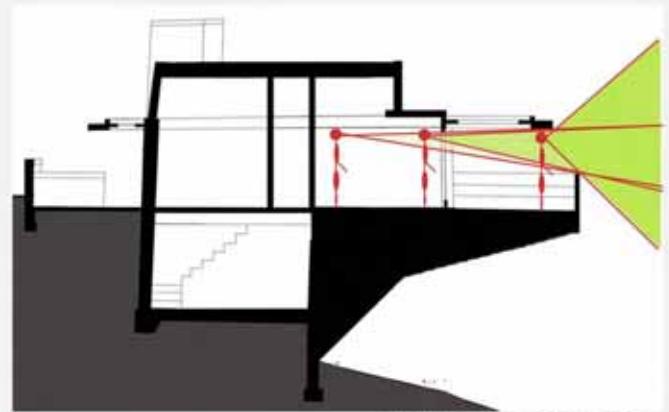
HAGAN HOUSE, 1953



REISLEY HOUSE, 1951



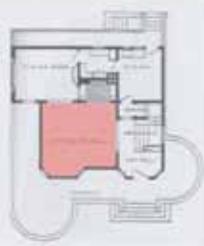
FALLINGWATER, 1934



SWAN RESIDENCE, 1953

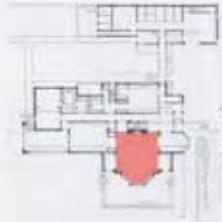
# ANALYSIS

:: LIVING ROOM SPATIAL



Frank Lloyd Wright House  
Oak Park, Illinois, 1889

View of living room  
and inglenook



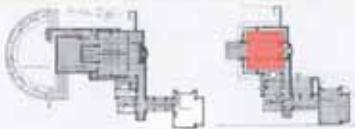
B. Harley Bradley House  
Kankakee,  
Illinois, 1900



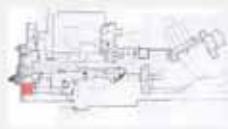
Darwin D. Martin House  
Buffalo, New York 1904



Francis W. Little House  
Wayzata, Minnesota, 1903



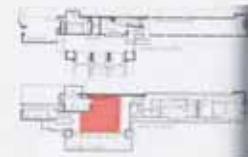
Samuel Freeman House, Los Angeles, California, 1924



Talliesin III  
Spring Green,  
Wisconsin,  
1925



Herbert F. Johnson House  
Racine, Wisconsin, 1937

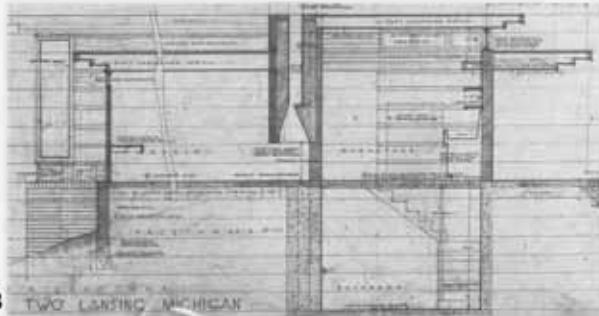


Lloyd Lewis House  
Libertyville, Illinois  
1940

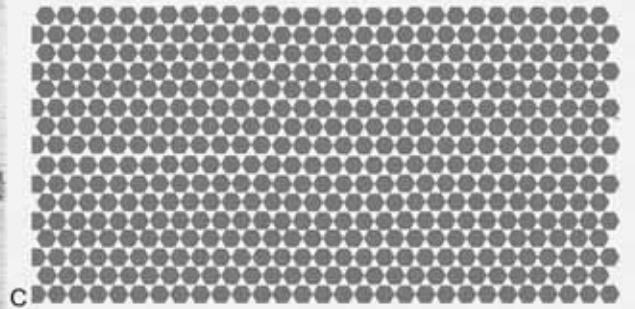




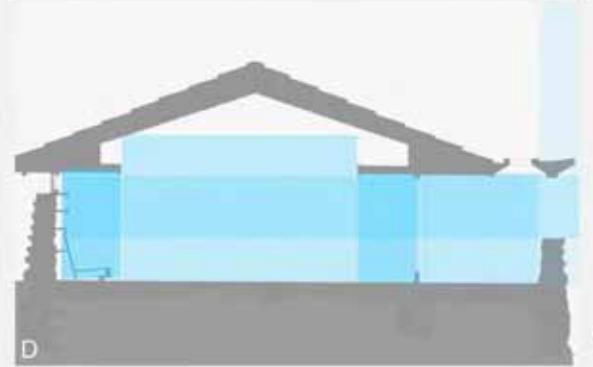
A



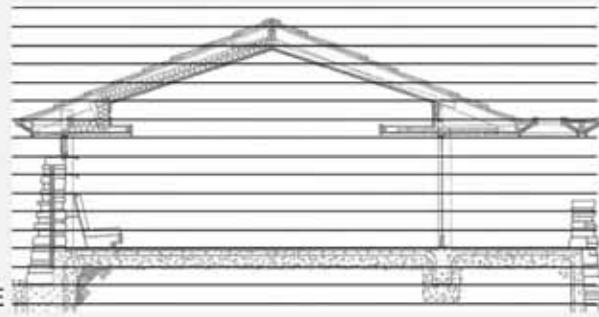
B



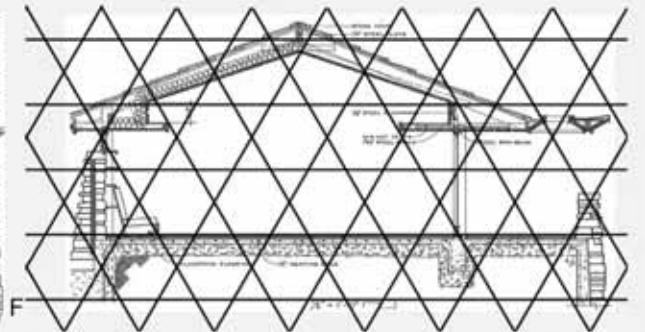
C



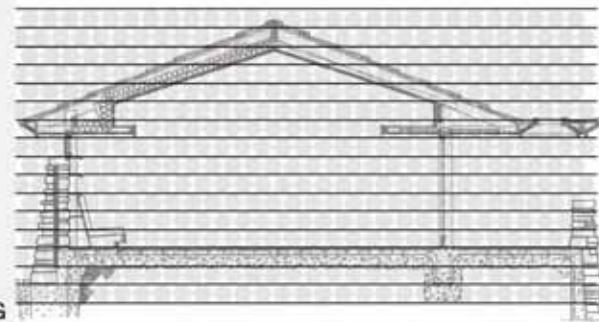
D



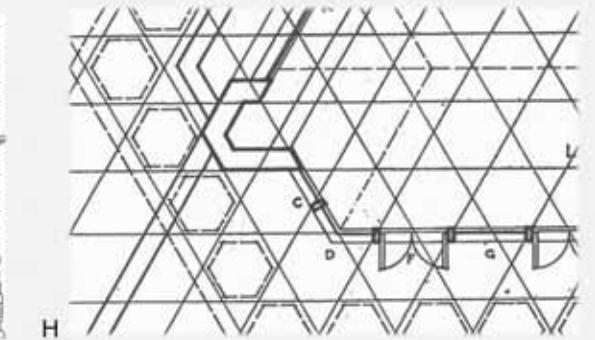
E



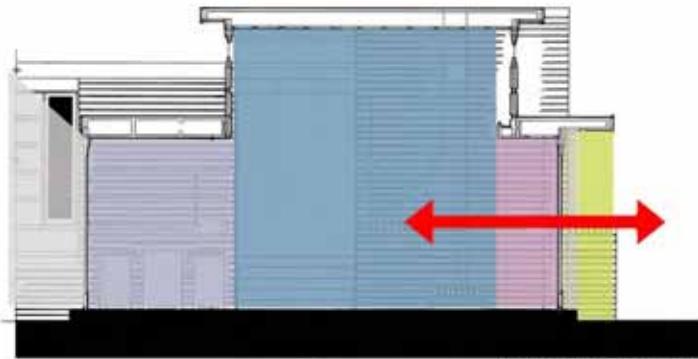
F



G



H

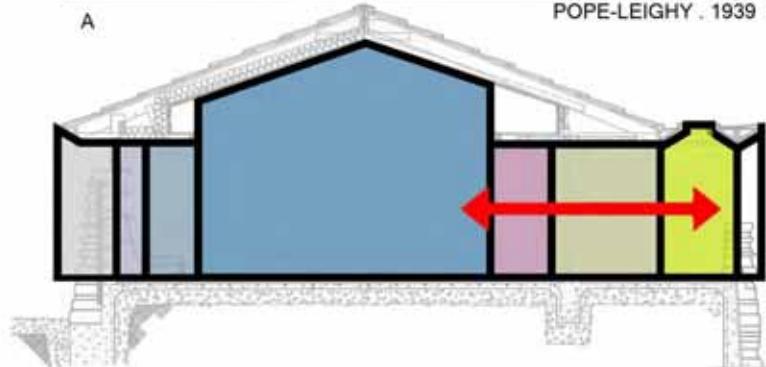


A

POPE-LEIGHY . 1939

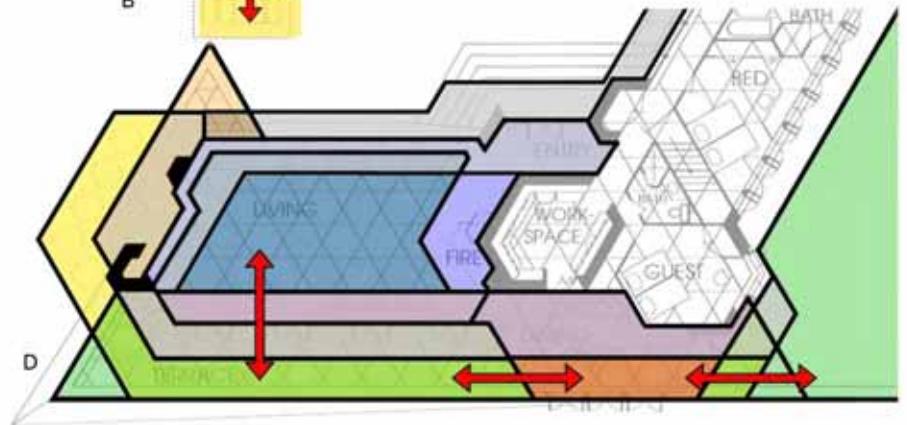


B



C

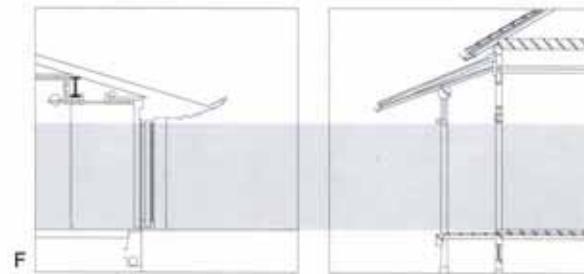
KENTUCKY KNOB



D

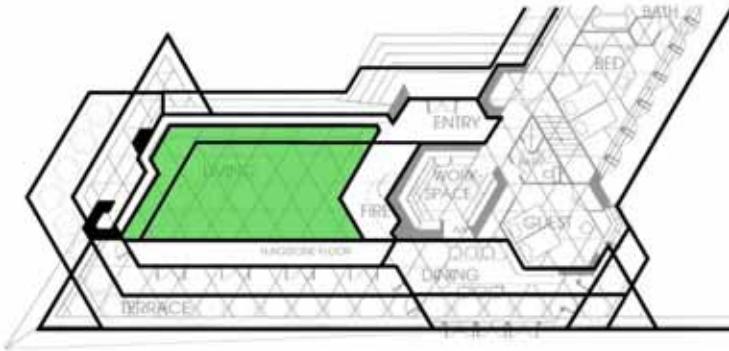


LACEAU ANALYSIS

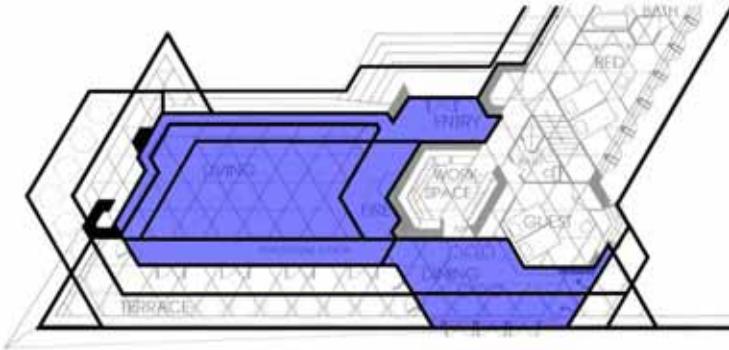


F

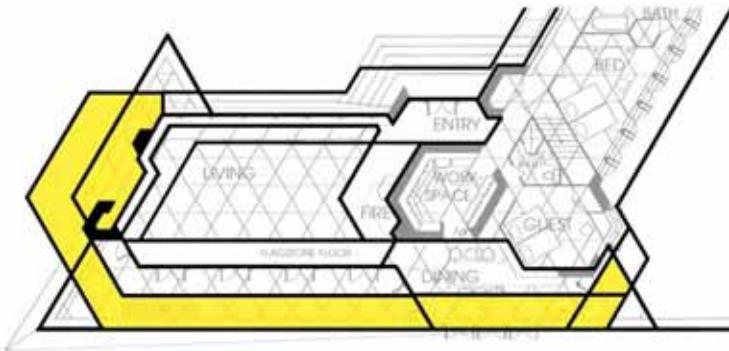
A



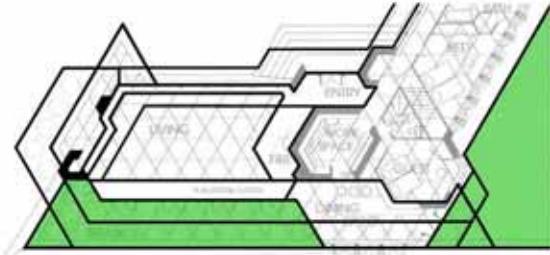
B



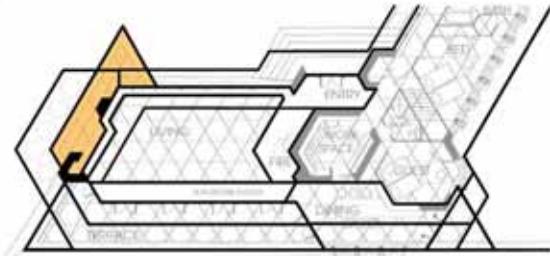
C



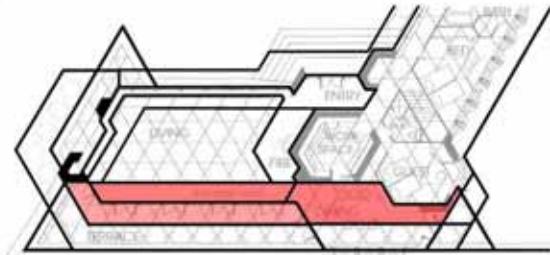
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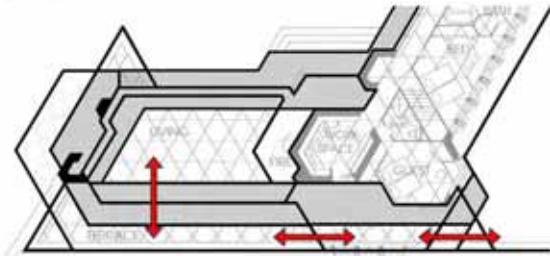
E



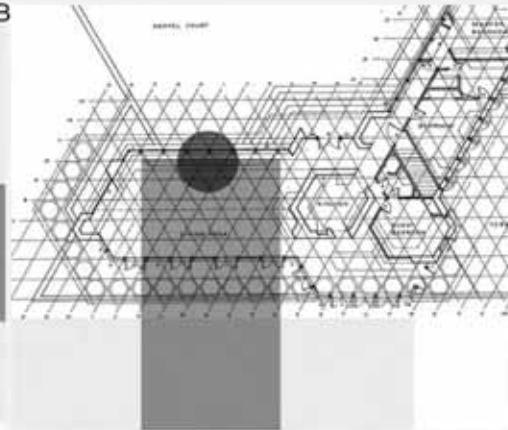
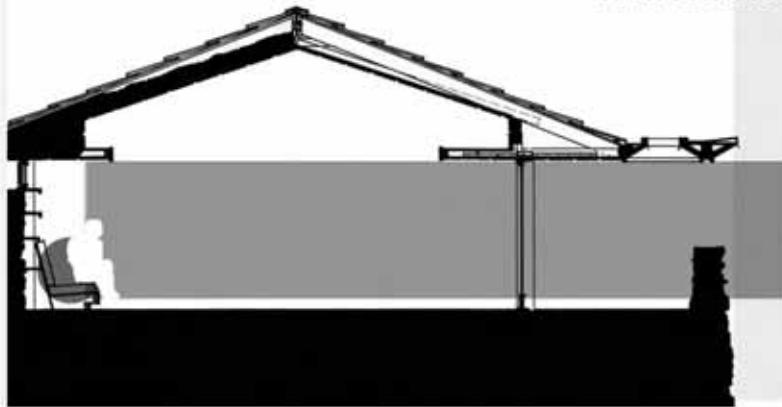
F



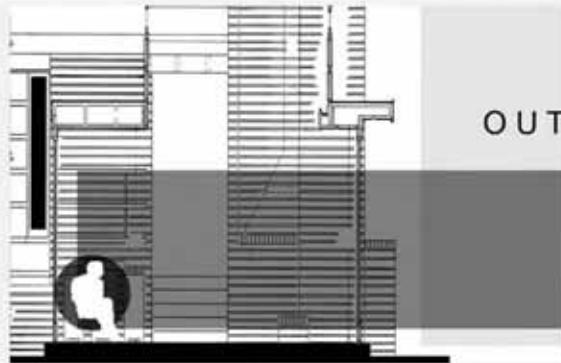
G



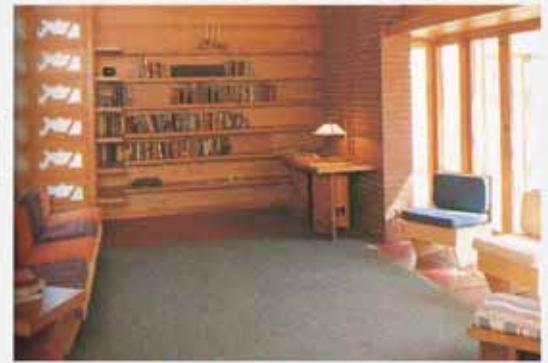
KENTUCK KNOB



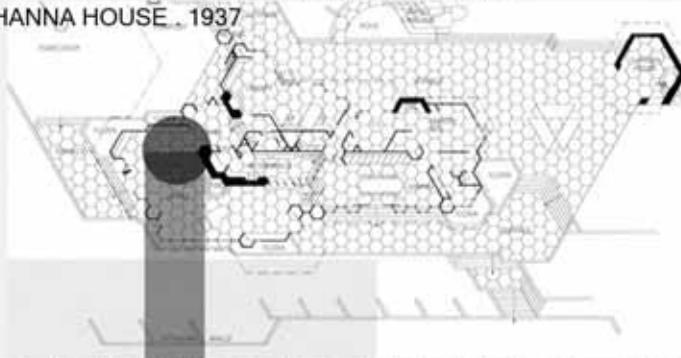
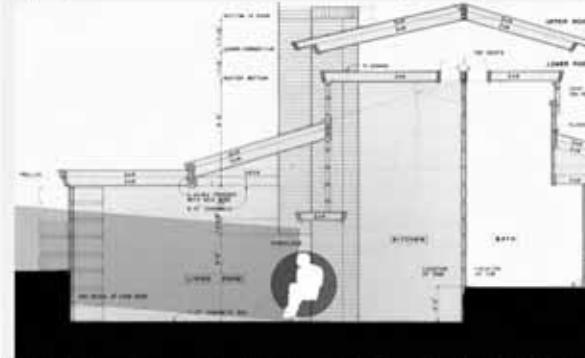
POPE-LEIGHEY . 1939



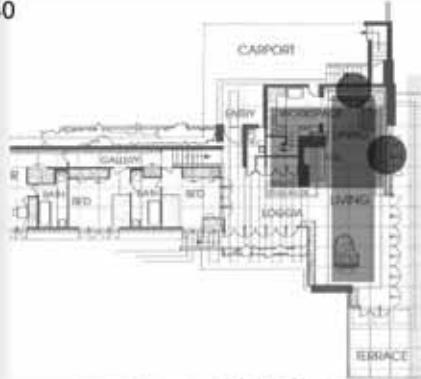
OUTWARD FACING  
BUILT-INS



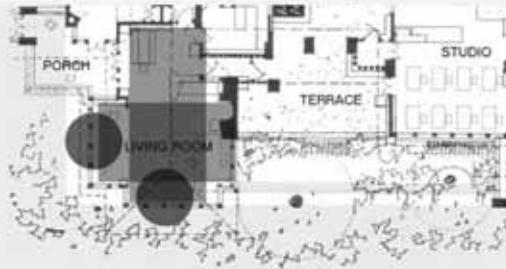
HANNA HOUSE . 1937



AFFLECK HOUSE . 1940

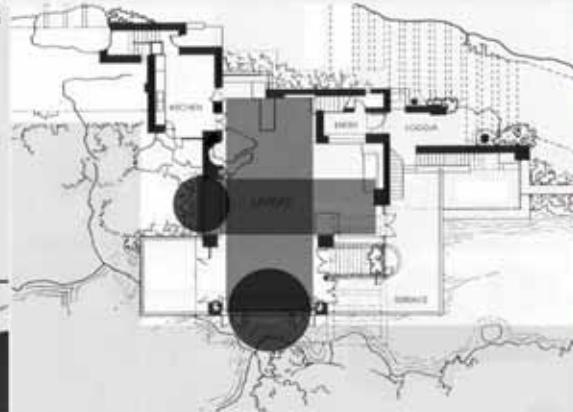
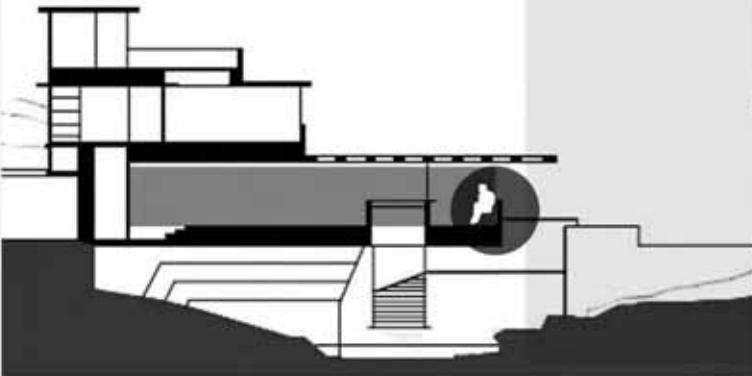


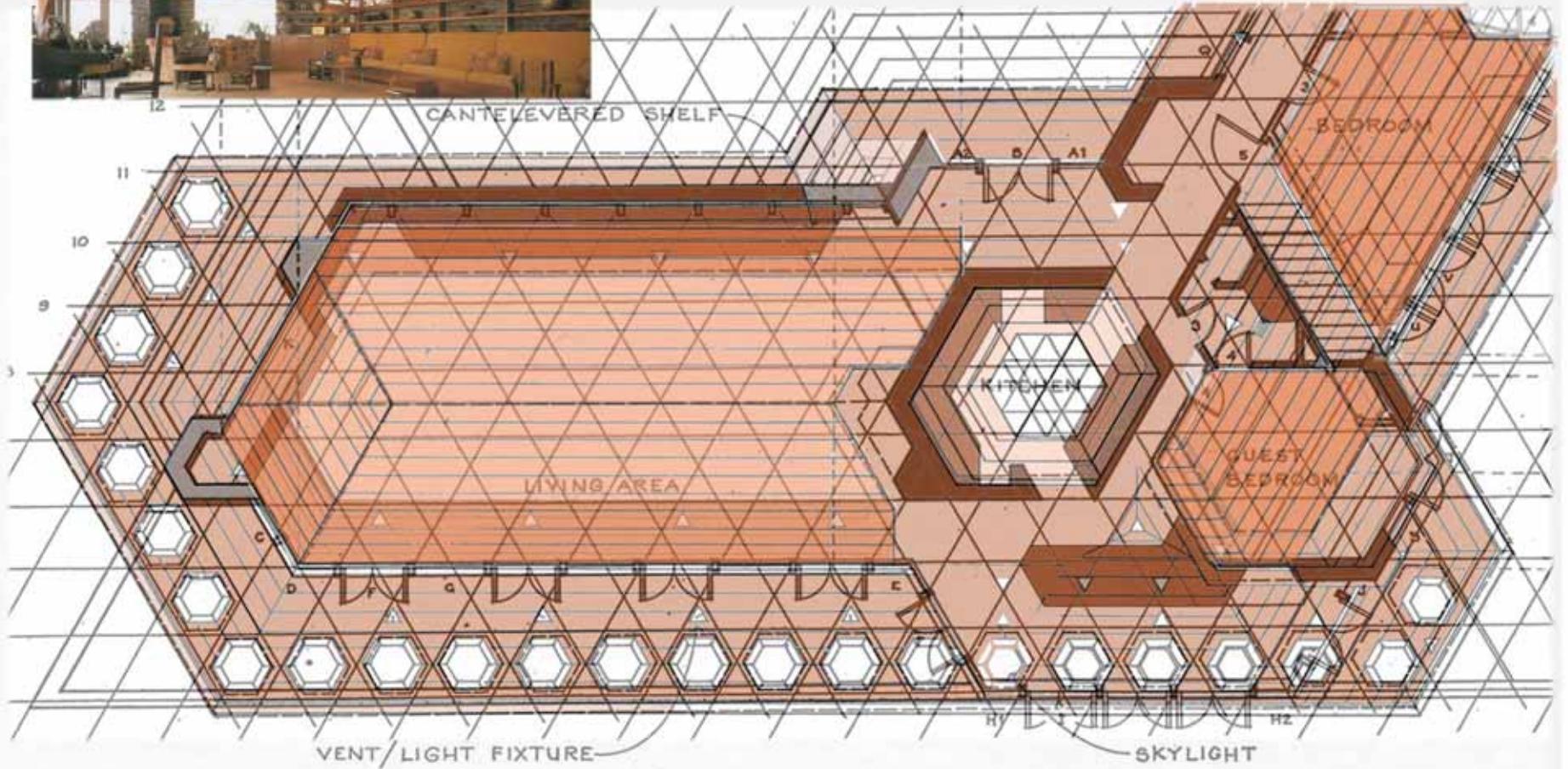
TALIESIN EAST . 1925

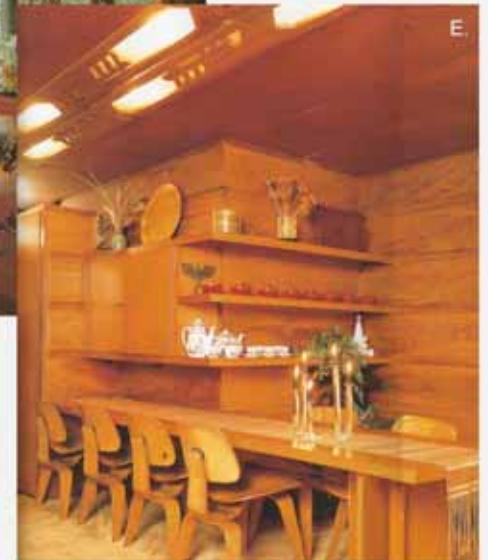
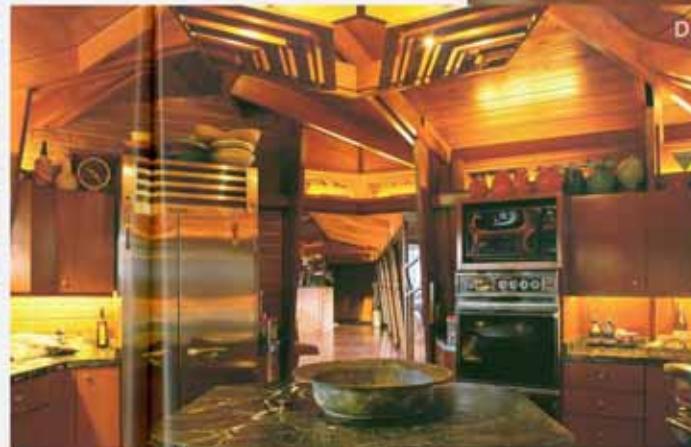
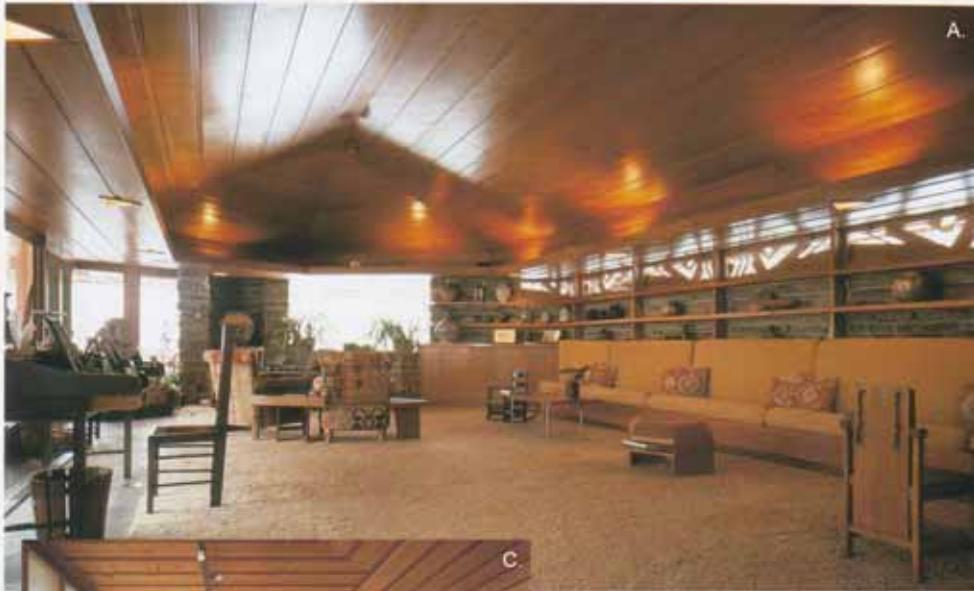


# INWARD FACING BUILT-INS

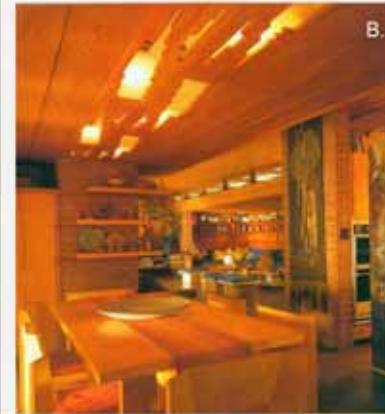
FALLINGWATER . 1936







A. HAGAN HOUSE, 1953  
 B. PALMER HOUSE, 1950  
 C. JACOBS HOUSE, 1936  
 D. AULDBRASS, 1938  
 E. ROSENBAUM HOUSE, 1939



A. HAGAN HOUSE, 1953  
 B. M. SMITH HOUSE, 1946  
 C. ANTHONY HOUSE, 1949  
 D. BAZETT HOUSE, 1939  
 E. PALMER HOUSE, 1950



A. HAGAN HOUSE, 1953  
 B. SMITH HOUSE, 1946  
 C. FALLINGWATER, 1934  
 D. MOSSBERG HOUSE, 1946  
 E. HAGAN HOUSE, 1953  
 F. OAK PARK, 1889



A.

- A. WALTER HOUSE, 1945
- B. FALLINGWATER, 1934
- C. FLORIDA SOUTHERN COLLEGE, 1945
- D. TALIESIN, 1925
- E. LOVNESS HOUSE, 1955



B.



C.



D.



E.



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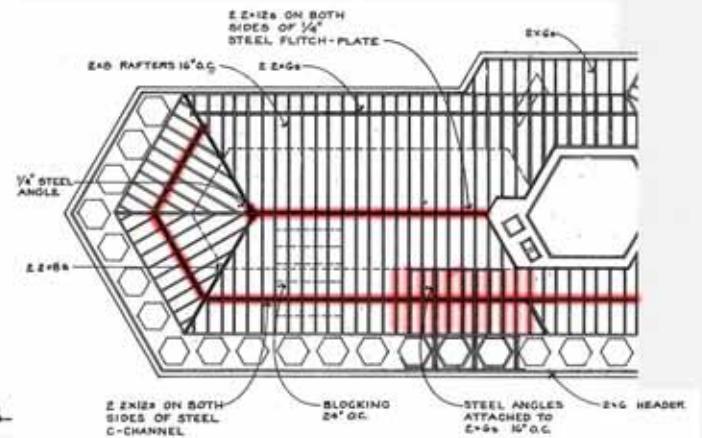
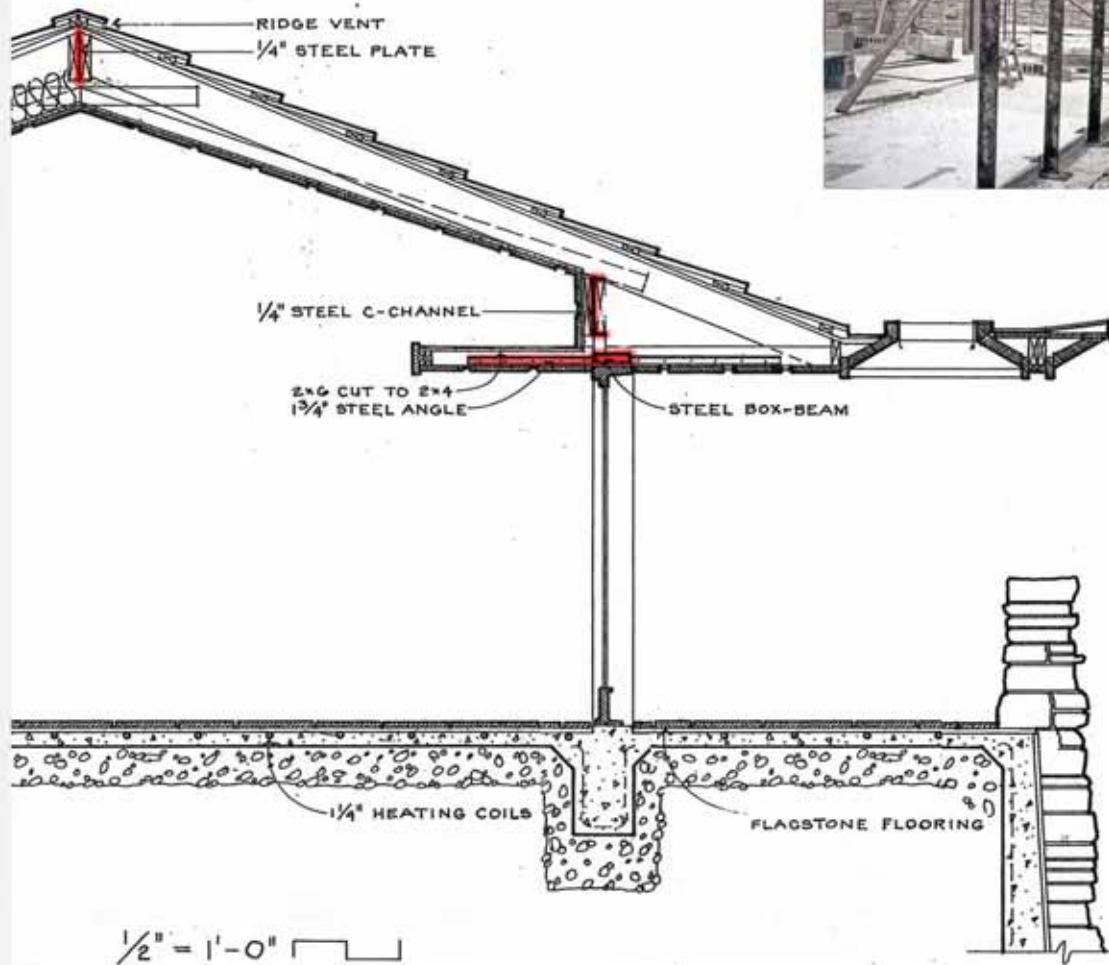


CARNEGIE  
MELLON  
UNIVERSITY  
ARCHITECTURE

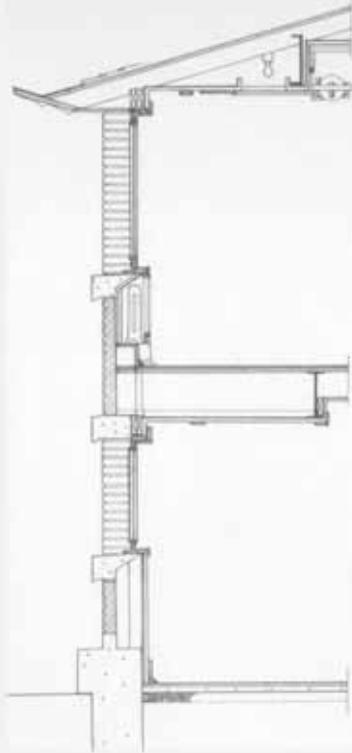
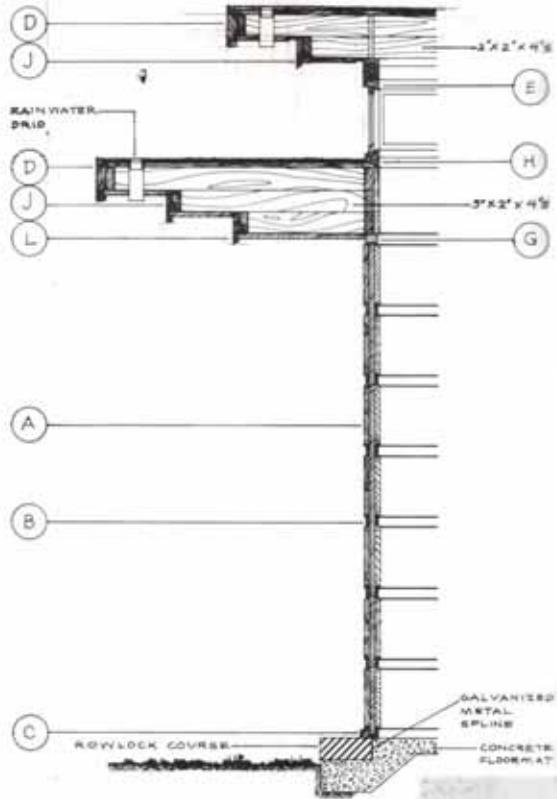
FLWRIGHT'S HOUSE FOR L. N. HAGAN, CHALK HILL, PA 1953-1956  
**KENTUCK KNOB**  
PRECEDENT :: ANALYSIS :: TRANSFORMATION

WOODEN  
CAVES

**F13**



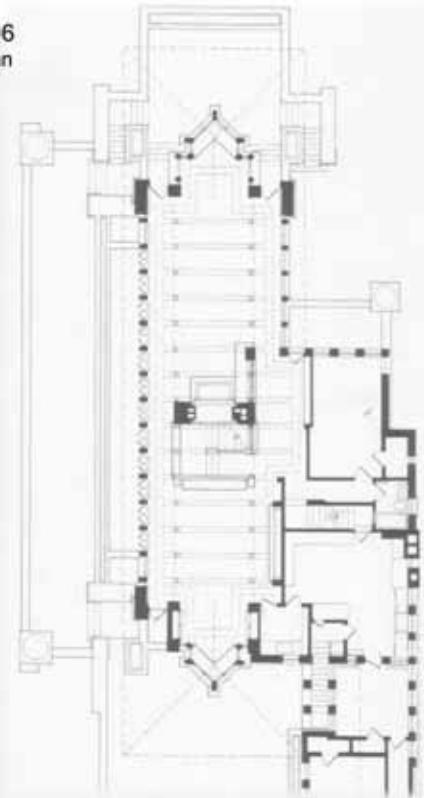
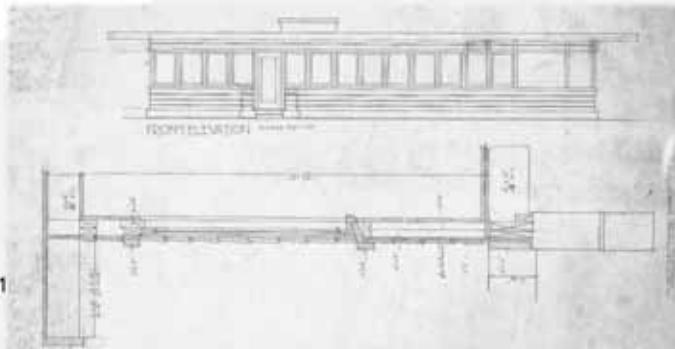
TYPICAL USONION WALL SECTION



ROBIE HOUSE . 1906  
detail section.section plan

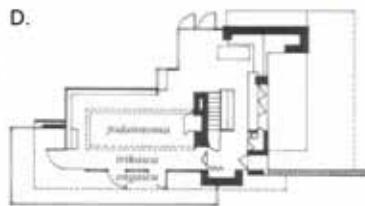
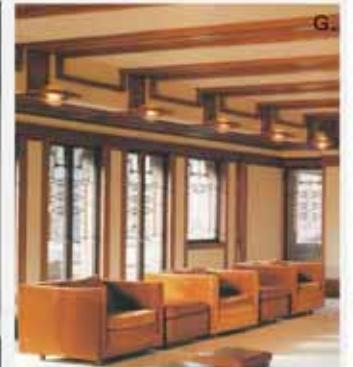


SHERMAN BOOTH  
SUMMER COTTAGE . 1911





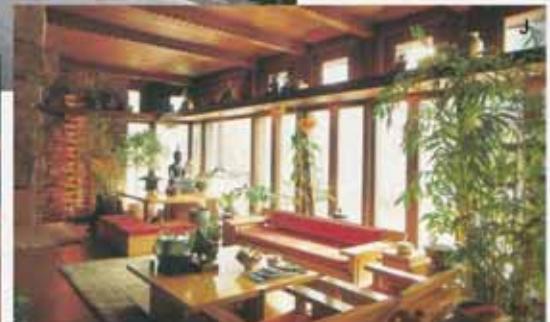
- A. KENTUCK KNOB, 1954
- B. R.L. WRIGHT HOUSE, 1956
- C. F.C. BOGK HOUSE, 1916
- D. PEW HOUSE, 1940
- E. SAMARA, 1954
- F. USONIAN EXHIBITION HOUSE, 1953
- G. ROBIE HOUSE, 1906
- H. BRADLEY HOUSE, 1900
- J. LOVNESS HOUSE, 1958

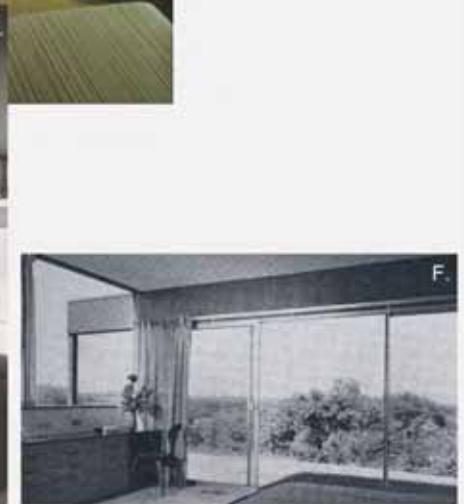
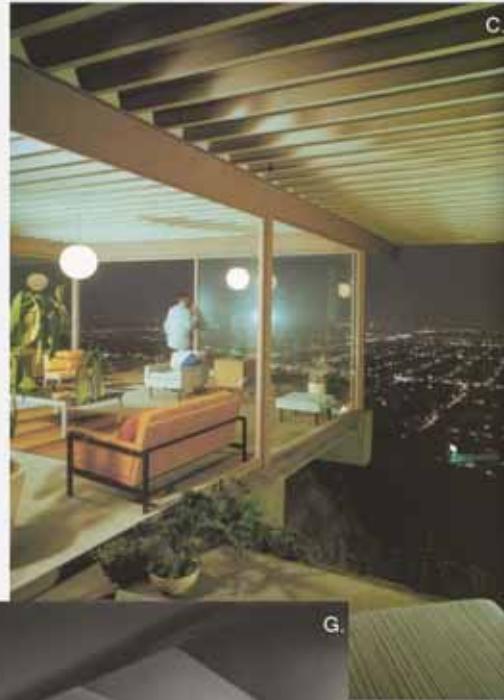


3.41 Plan of the John C. Pew house, Madison, Wisconsin, 1940.

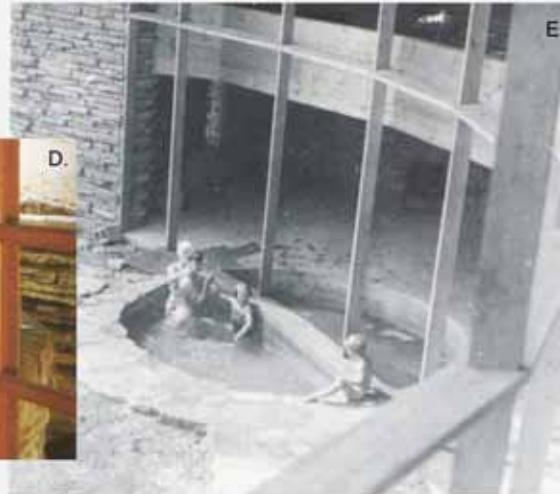
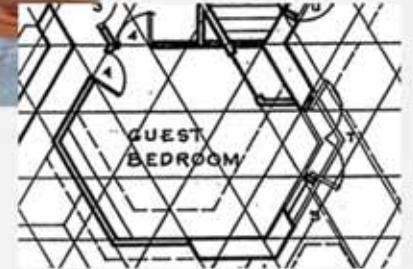
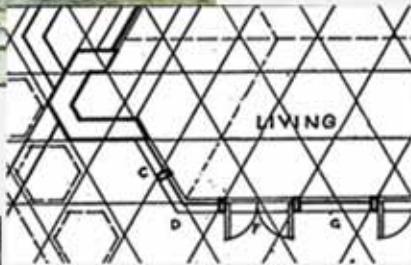


3.41 Spatial layering in the John C. Pew house. (Cruz Smoller ©Eno)

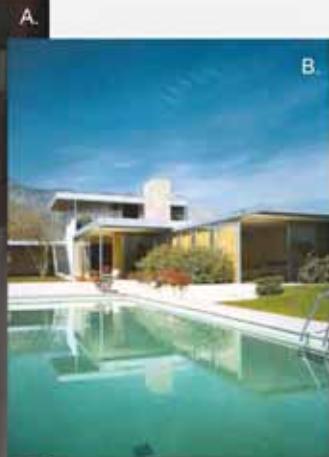




A. DEERING RESIDENCE, 1956 (P. RUDOLPH)  
 B. STAHL HOUSE, 1960 (P. KOENIG)  
 C. BURKHARDT RESIDENCE, 1956 (P. RUDOLPH)  
 D. COHEN RESIDENCE, 1953 (P. RUDOLPH)  
 E. BURKHARDT RESIDENCE, 1956 (P. RUDOLPH)  
 F. DEERING RESIDENCE, 1956 (P. RUDOLPH)  
 G. COHEN RESIDENCE, 1953 (P. RUDOLPH)



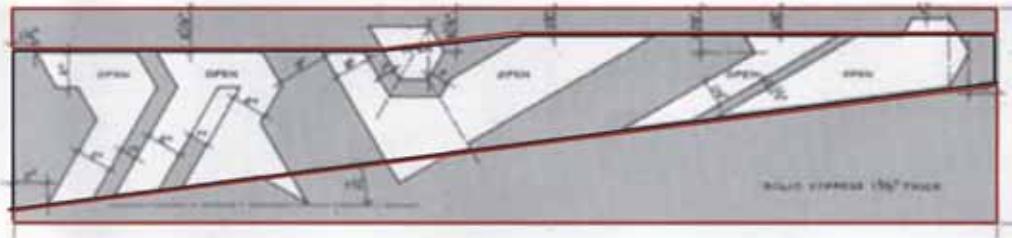
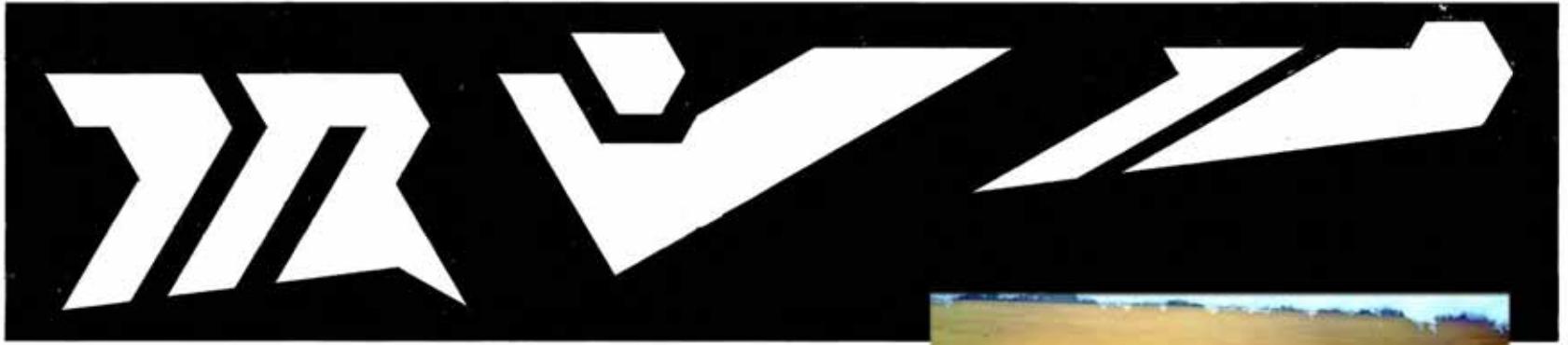
A-C: HAGAN HOUSE . 1954  
 D: FALLINGWATER . 934  
 E: JACOBS HOUSE . 1944



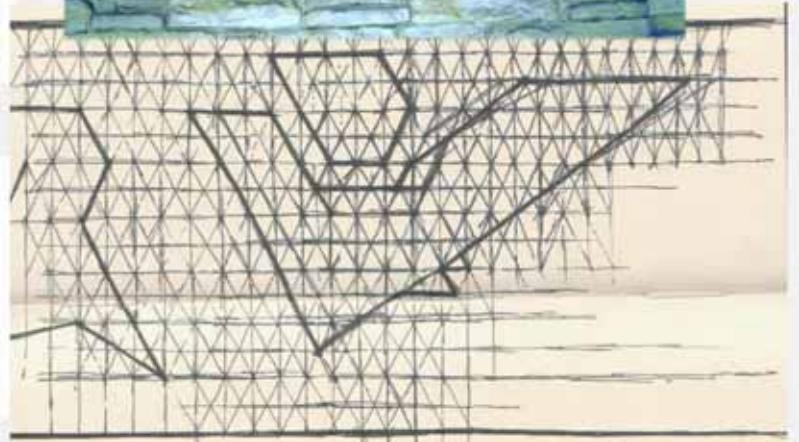
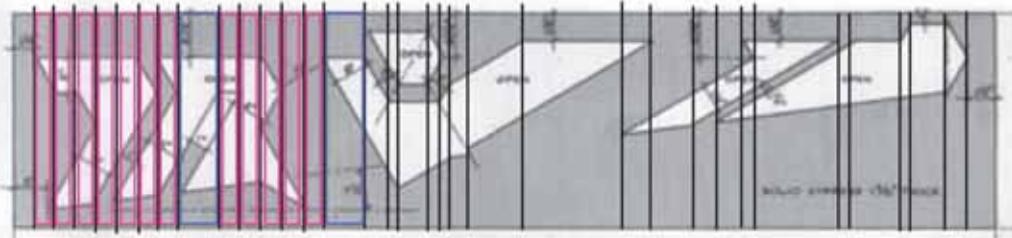
A. MORRIS HOUSE, 1955 (A. MORRIS)  
 B. KAUFFMAN HOUSE, 1946 (R. NEUTRA)  
 C. STAHL HOUSE, 1960 (P. KOENIG)  
 D. TREMAINE HOUSE, 1947 (P. NEUTRA)  
 E. CASA OSCAR NIEMEYER, 1953  
 F. NESBIT HOUSE, 1941 (R. NEUTRA)  
 G. BUCERIS HOUSE, 1966 (R. NEUTRA)  
 H. FARNSWORTH HOUSE, 1946 (M. VAN DER ROHE)

# CUTOUT

:: WINDOWS



LIGHT / DARK BALANCE  
GEOMETRIC RHYTHM

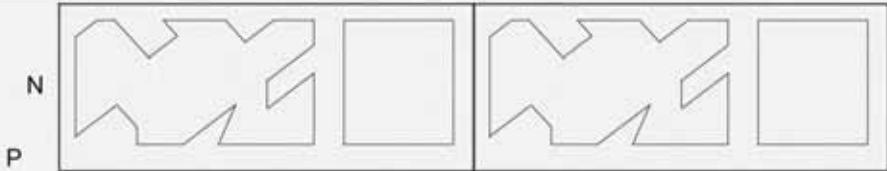




A

- A: KENTUCK KNOB
- B: POPE-LEIGHY . 1939
- C: KUNDERT MEDICAL CLINIC . 1955
- D: WELTZHEIMER RESIDENCE . 1948
- E: FAWCETT RESIDENCE . 1955
- F: BERNARD SCHWARTZ HOUSE . 1939
- G: AULDBRASS . 1939
- J: M.M.SMITH . 1946
- K: GUGGENHEIM USONIAN . 1953
- L: SAMARA . 1954
- M: M.M.SMITH . 1939
- N: BAZETT HOUSE . 1939
- O: DUEY WRIGHT HOUSE . 1956

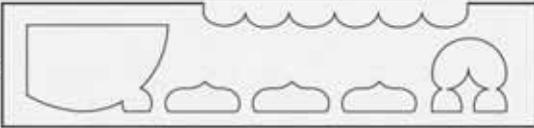
NOT PICTURED: ABLIN . CARR .  
 COMMUNITY CHURCH KANSAS CITY  
 GILLAN . LEVIN . MCCARTNEY .  
 ROSENBAUM . STROMQUIST



B



C

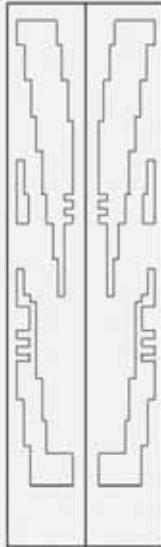


D

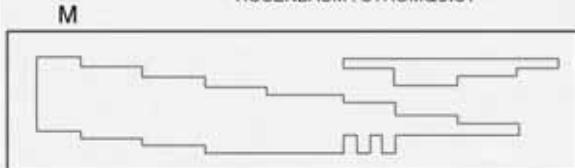


E

F



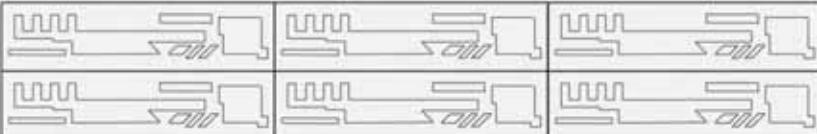
J



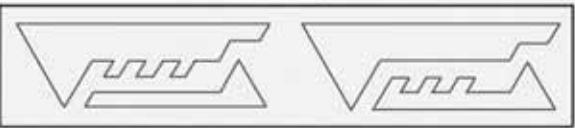
M



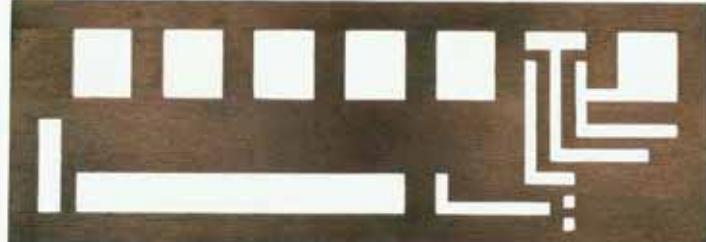
L



G



H

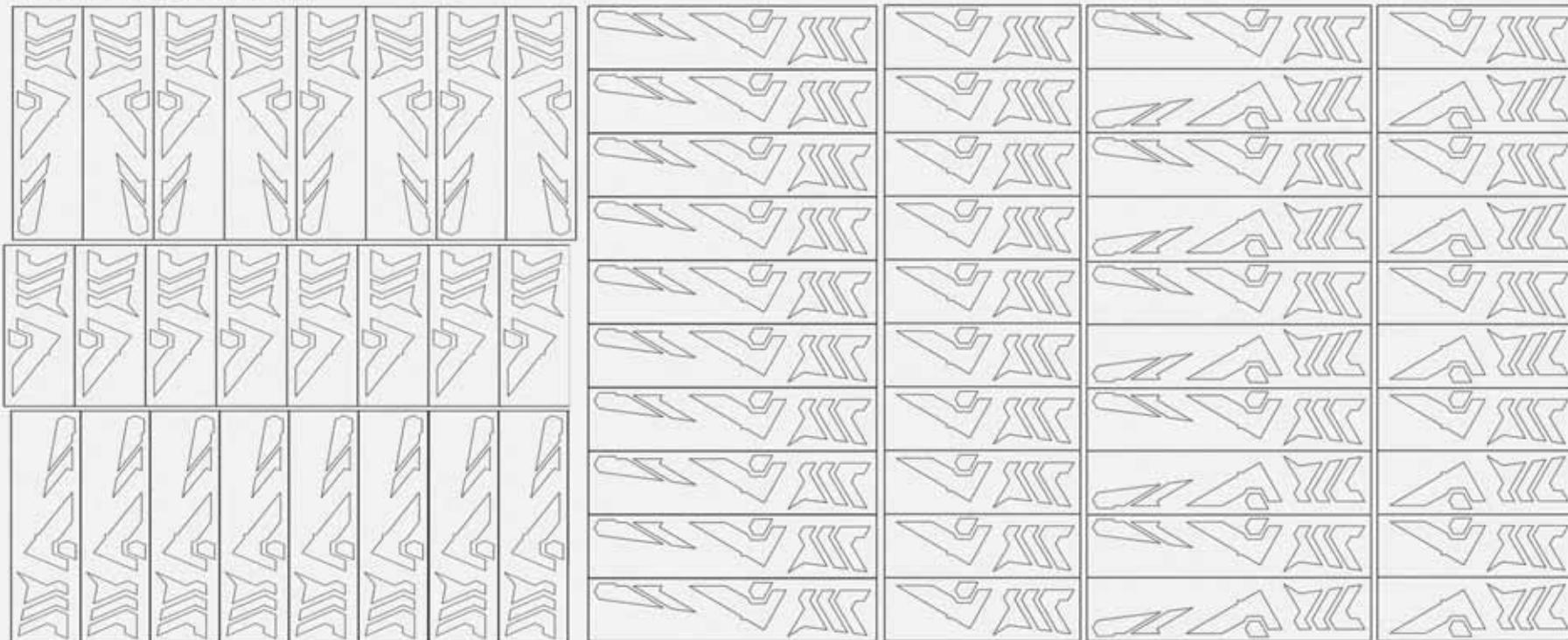


K

ACTUAL ARRANGEMENT



POSSIBLE CONFIGURATIONS





A



B



D



C



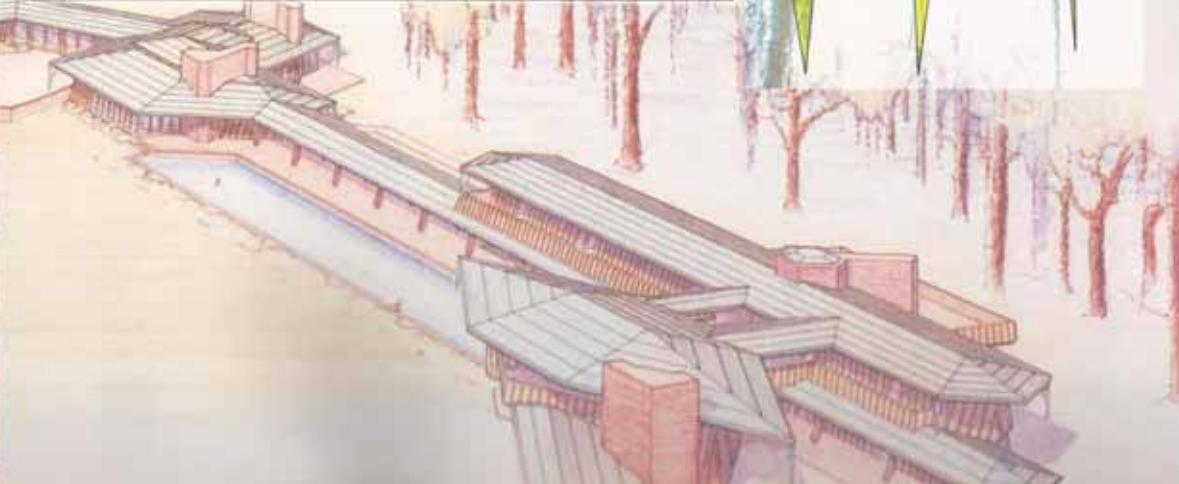
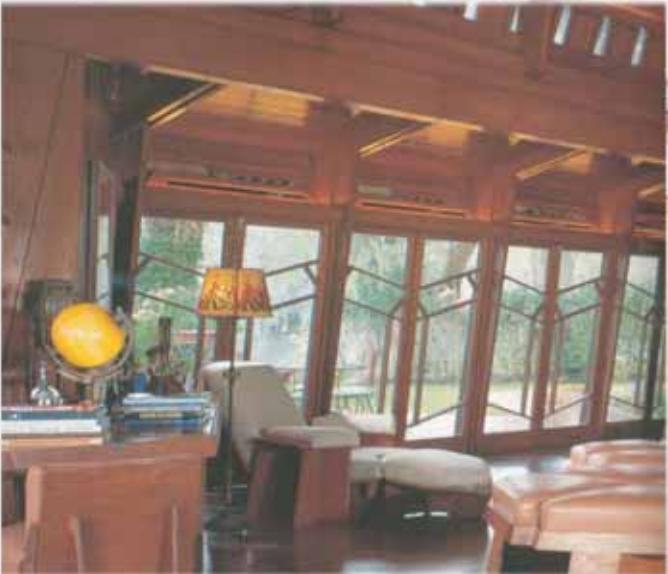
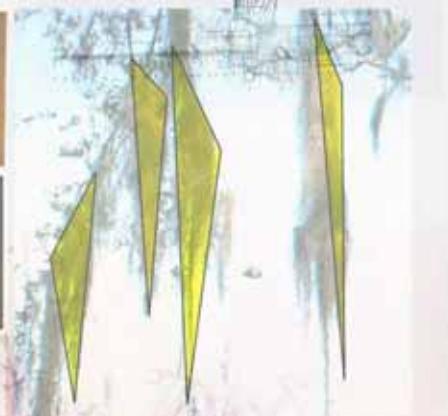
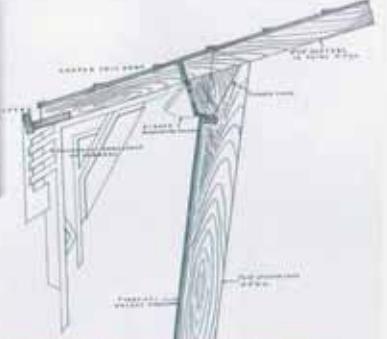
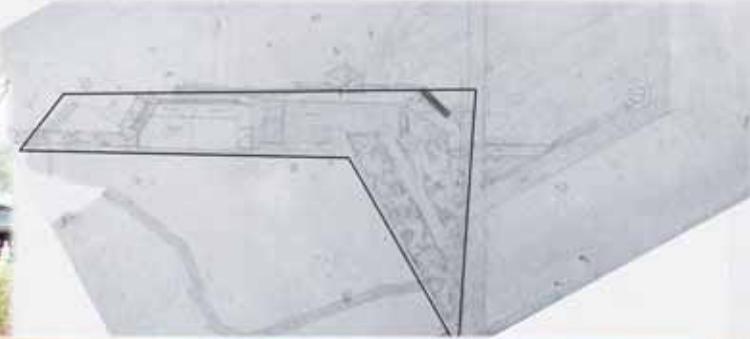
POPE-LEIGHEY HOUSE . 1939

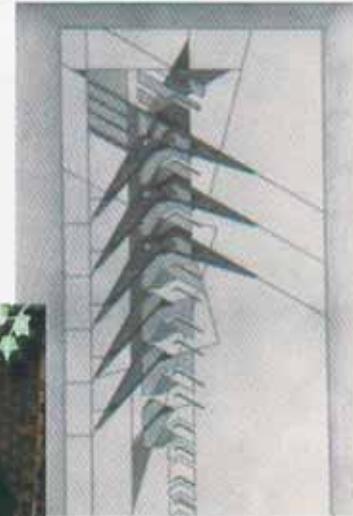
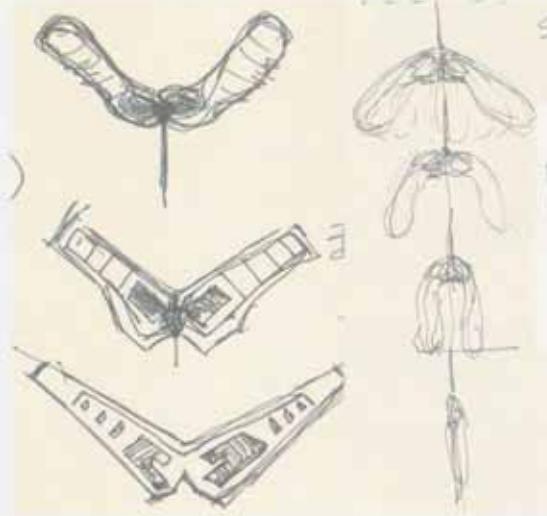
G

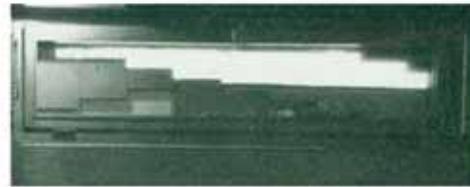


F

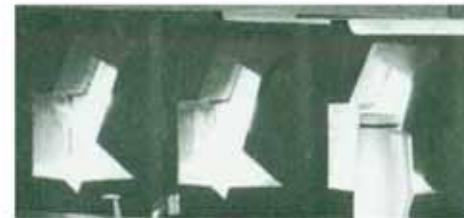
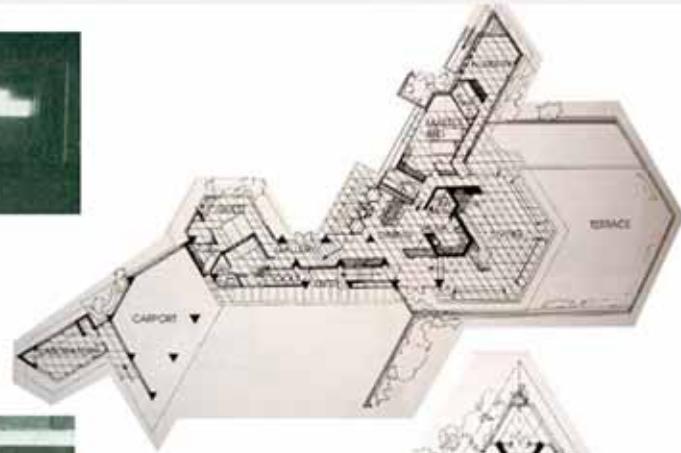




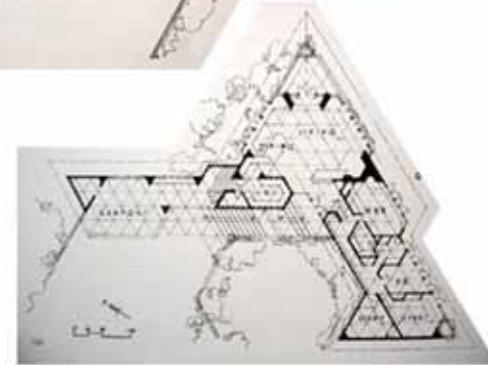




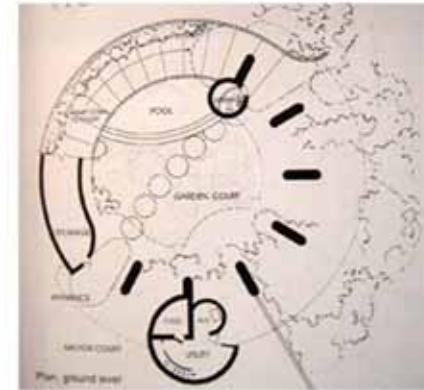
WALL HOUSE . 1941



PALMER HOUSE . 1950

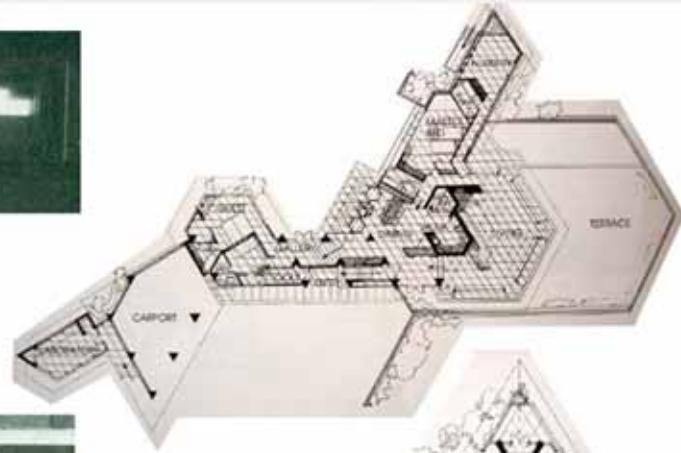


DAVID WRIGHT HOUSE . 1950

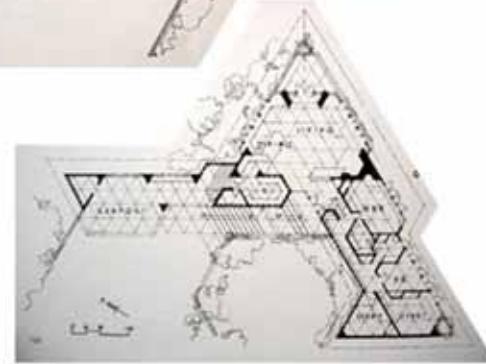




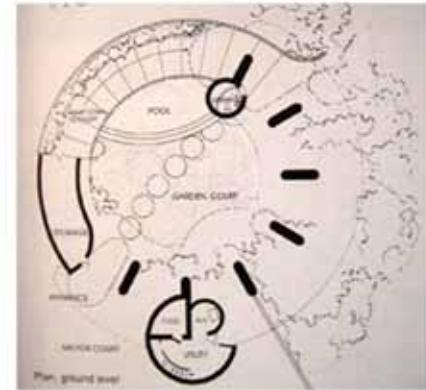
WALL HOUSE . 1941



PALMER HOUSE . 1950

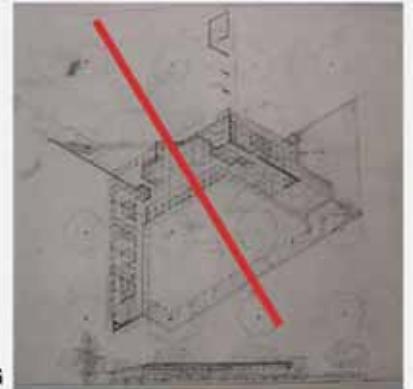


DAVID WRIGHT HOUSE . 1950



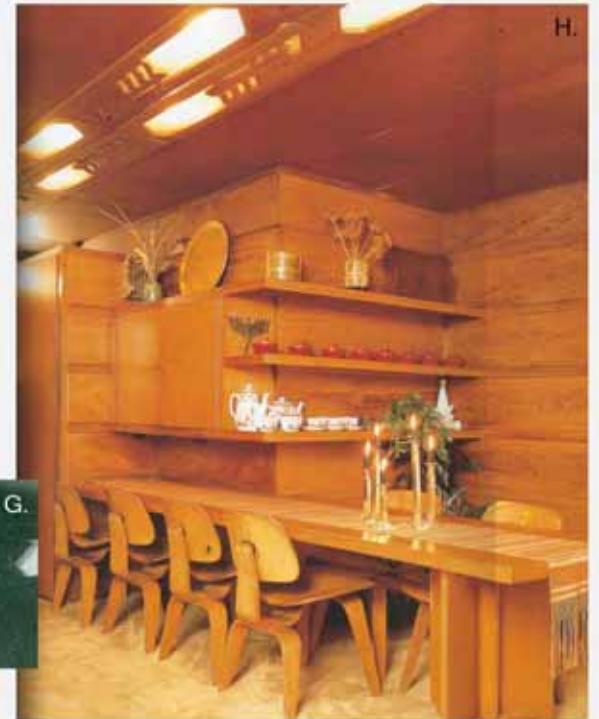


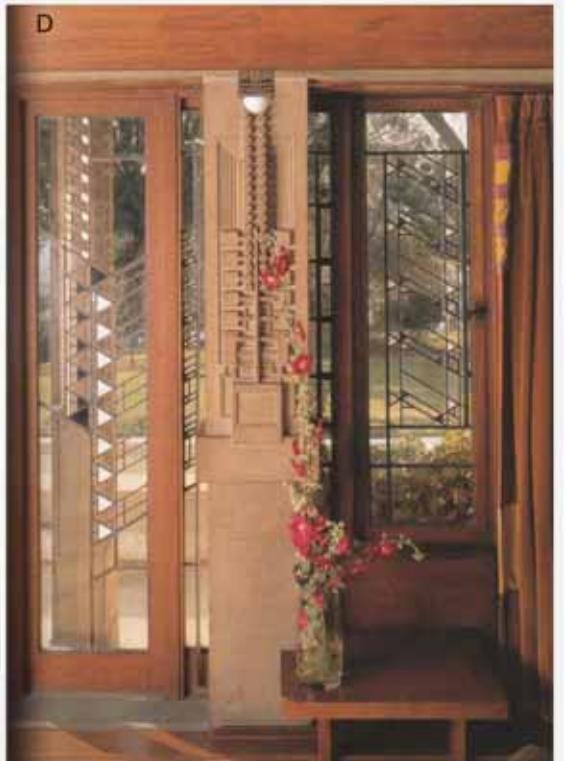
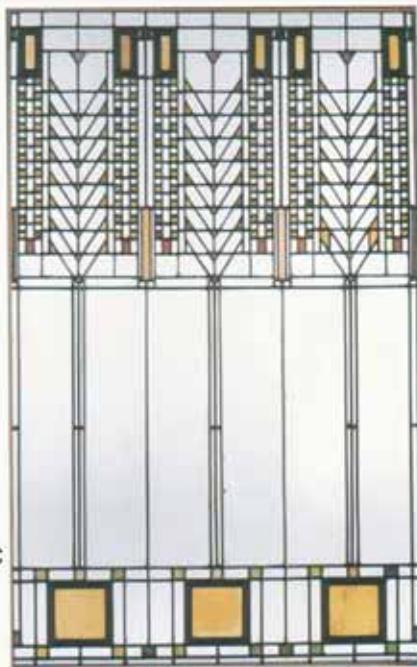
FAWCETT RESIDENCE . 1955





A.-D. BERNARD SCHWARTZ RESIDENCE, 1939  
E.-H. ROSENBAUM RESIDENCE, 1939



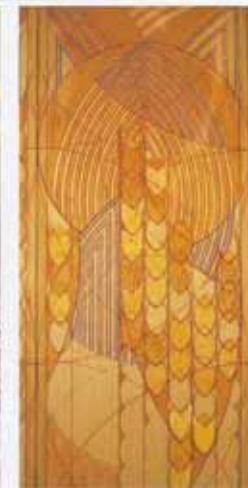


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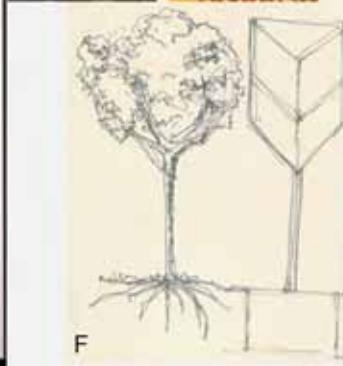
C



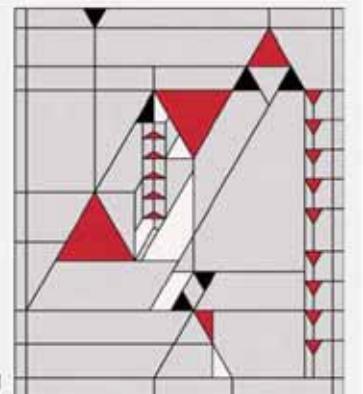
G



H

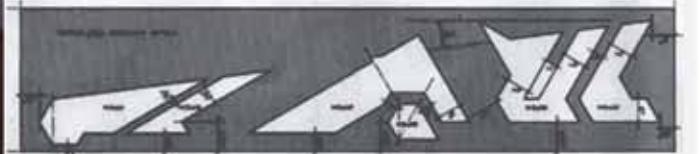
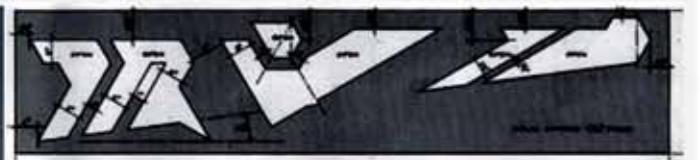


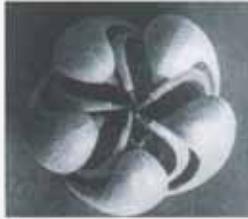
F



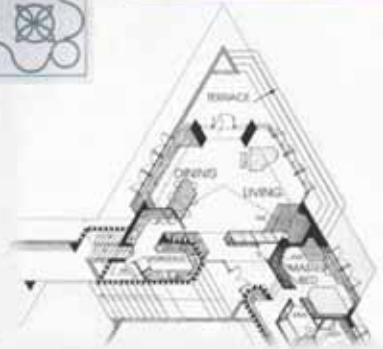
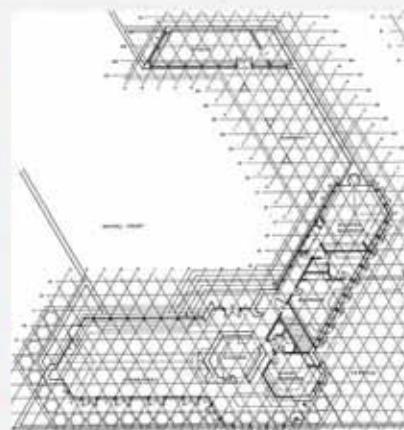
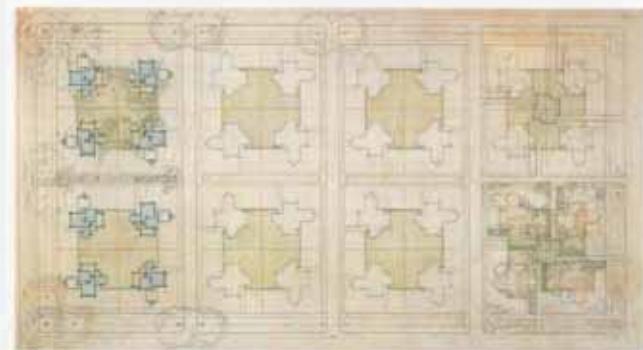
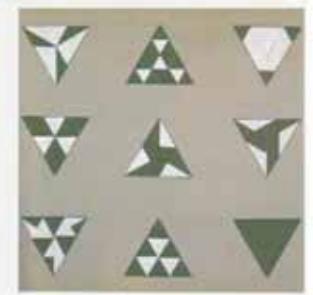
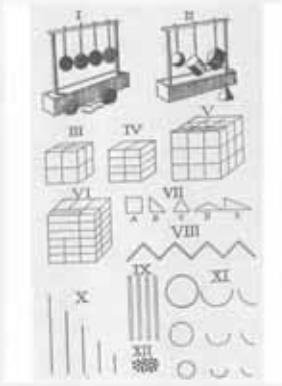
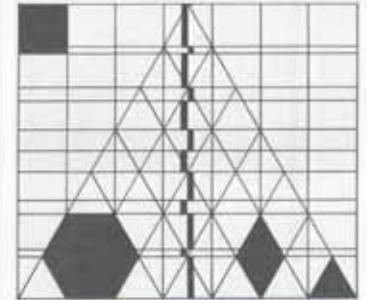
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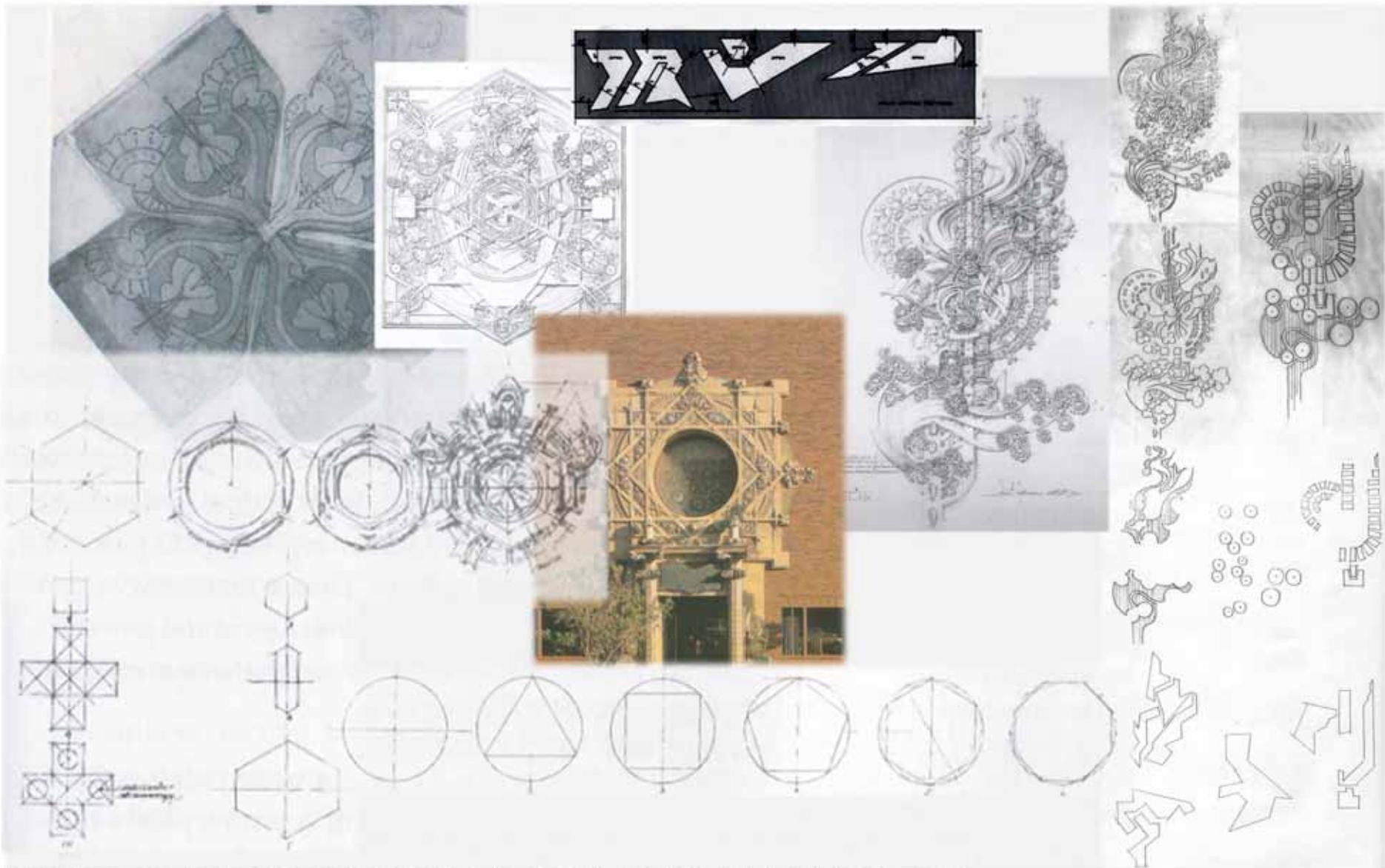






"THE VIRTUE OF ALL THIS LAY IN THE AWAKENING OF THE CHILD MIND TO RHYTHMIC STRUCTURE IN NATURE-GIVING THE CHILD A SENSE OF INNATE CAUSE-AND -EFFECT OTHERWISE FAR BEYOND CHILD COMPREHENSION. I SOON BECAME SUSCEPTIBLE TO THE CONSTRUCTIVE PATTERN EVOLVING IN EVERYTHING I SAW."  
- F R O E B E L



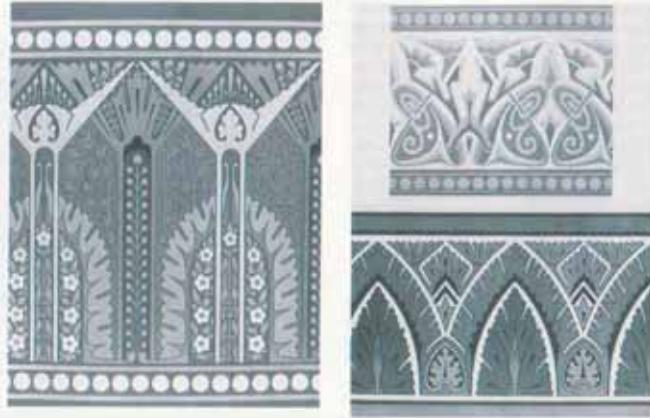


CARNEGIE MELLON UNIVERSITY ARCHITECTURE | FLWRIGHTS HOUSE FOR I N HAGAN, CHALK HILL, PA 1953-1956 | **KENTUCK KNOB** LOUIS SULLIVAN | G14  
 PRECEDENT :: ANALYSIS :: TRANSFORMATION

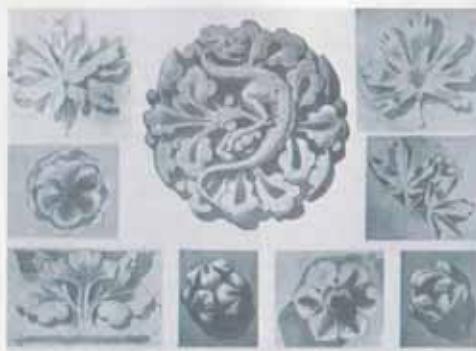
## Christopher Dresser

Figures 21  
Christopher Dresser,  
*Studies in Design*,  
London, 1875-1876, plate  
III. Courtesy Northwestern  
University Library.

Figures 22  
Christopher Dresser,  
*Studies in Design*, plate  
XXXI. Courtesy Northwestern  
University Library.



## Viollet-le-Duc



6. Viollet-le-Duc, decorative motifs from *Deuxième traité de Viollet-le-Duc*

## OWEN JONES

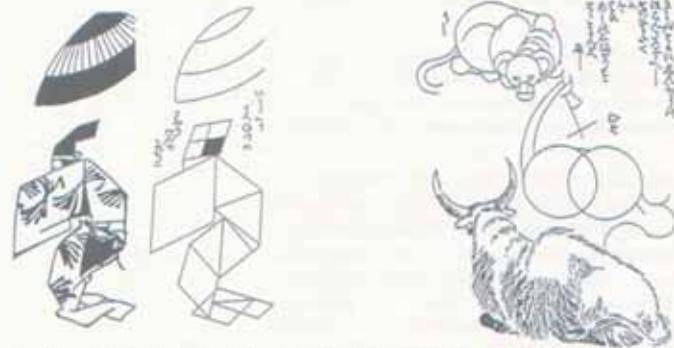


5 Owen Jones,  
*Egyptian, No. 47*  
*The Grammar of Ornament*, London:  
Day and Son, 1856.

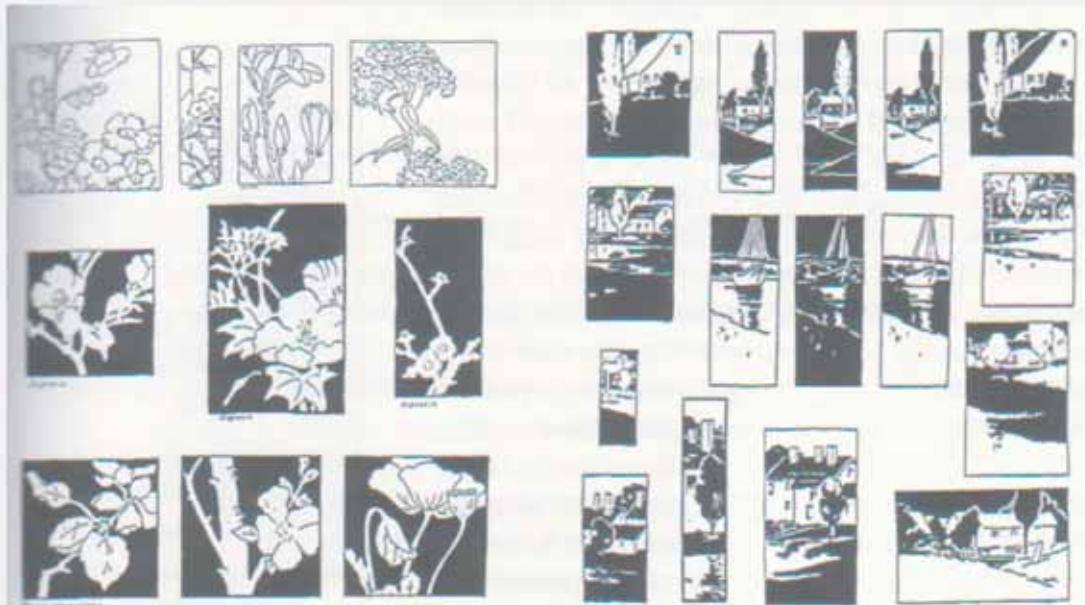


MAYAN ARCHITECTURE

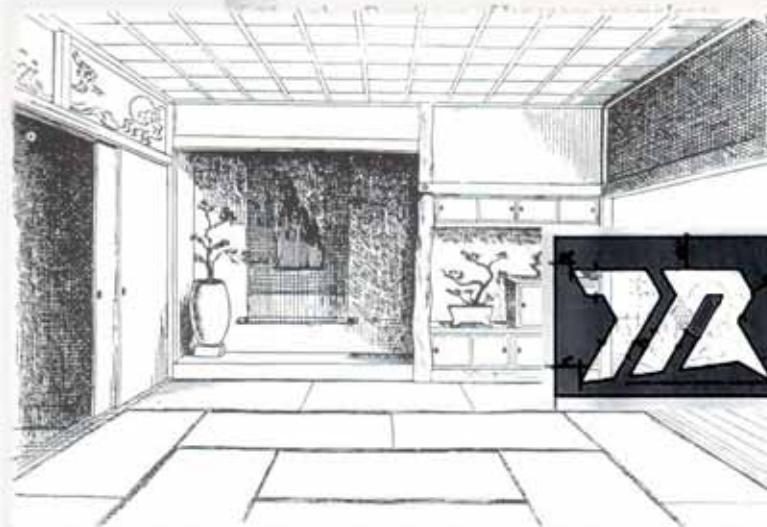
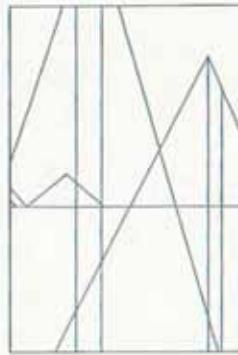
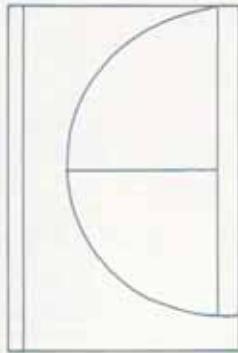




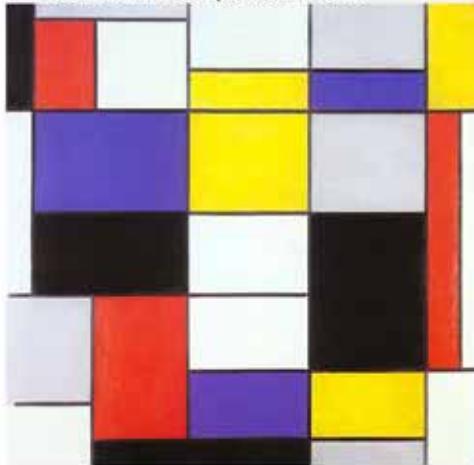
6.4 Illustrations from Kamohika Hokusa's *Ryuhoga Hoyo-sabite*, 1812.



6.23 Arthur Dow's illustration of *notan* in pictorial compositions of his own design, *Composition*, 1899.



Piet Mondrian. Composition A. 1923



Paul Klee. Suspended Fruit. 1921



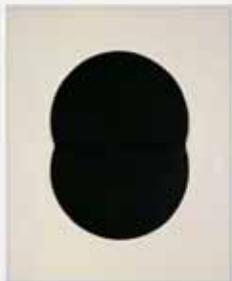
Mondrian. Lozenge



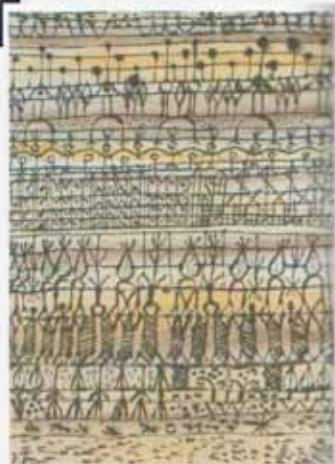
Matisse, Algae w Green Background 1947



Robert Motherwell Untitled 1951



Ellsworth Kelly. Study for White Plaque: Bridge Arch and Reflection. 1951



Paul Klee. Coolness in the Garden of the Torrid Zone. 1924



Willem de Kooning. Orestes



Henri Matisse. La Piscine. 1952

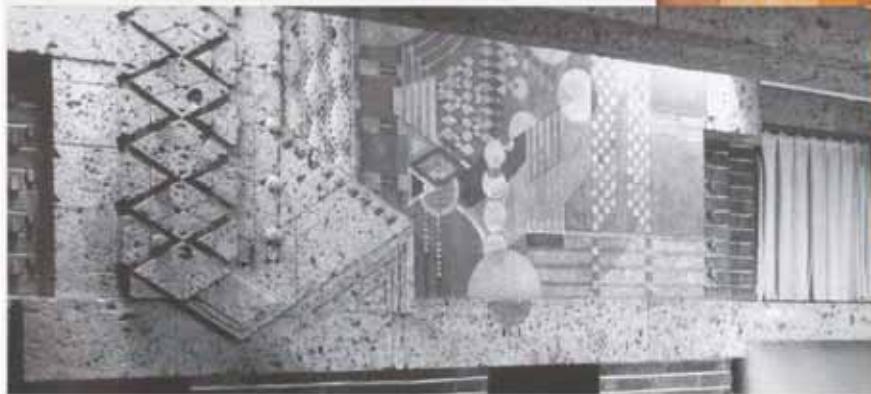


A

B



C



D

E



F



- A: KENTUCK KNOB
- B: KAUFMAN OFFICE . 1937
- C: KENTUCK KNOB
- D: IMPERIAL HOTEL . 1915
- E: FLW AUTOBIOGRAPHY
- F: PRICE TOWER . 1952
- G: MASSELINK DESIGN
- H: M.M.SMITH HOUSE . 1946

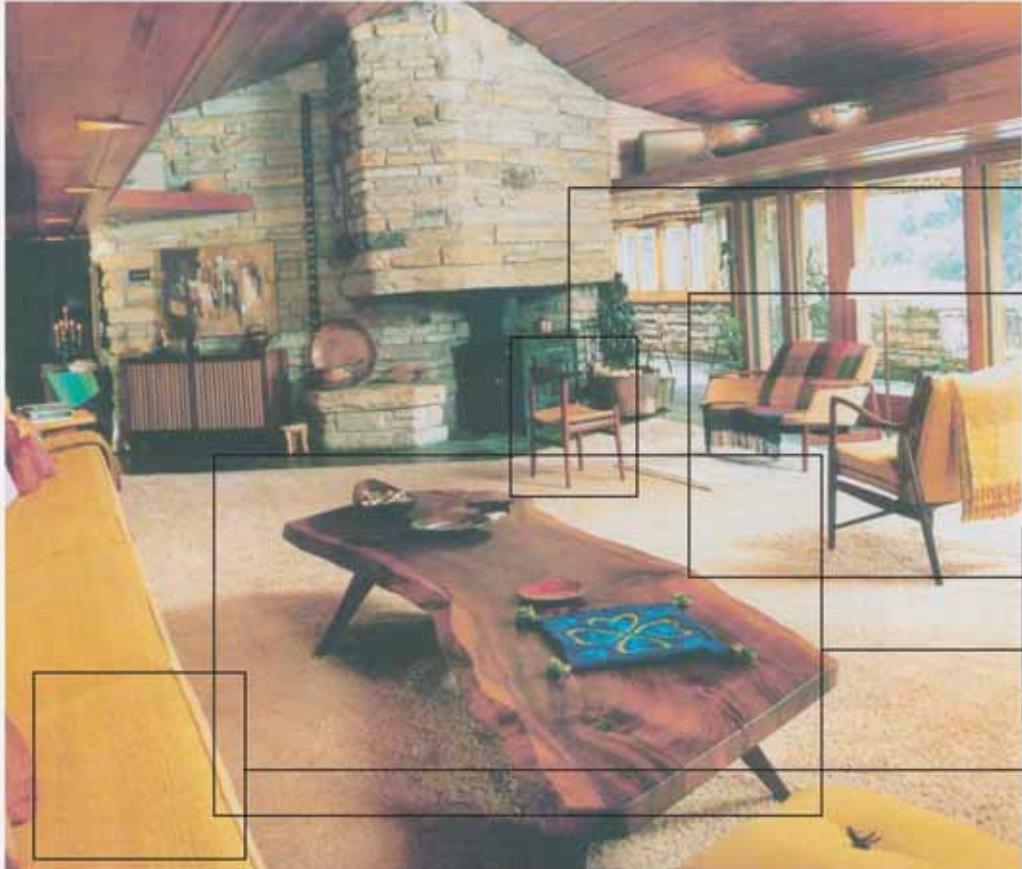
G



H



# FURNITURE



"THE CHAIR" BY HANS WEGNER

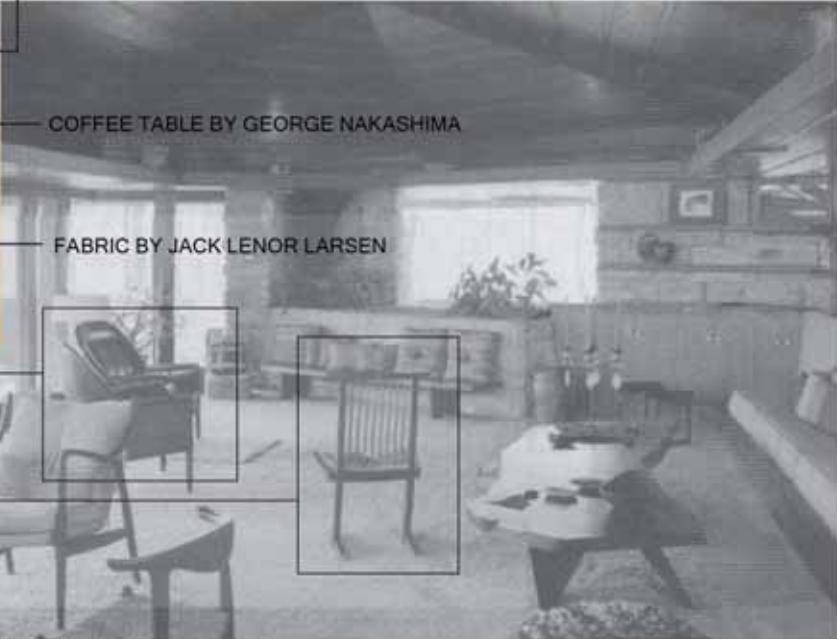
TWO SEATER AND ARMCHAIR BY FINN JUHL

COFFEE TABLE BY GEORGE NAKASHIMA

FABRIC BY JACK LENOR LARSEN

BLACK LEATHER ARMCHAIR BY HANS WEGNER

CHAIR BY GEORGE NAKASHIMA





A.



B.



C.



D.



E.



F.



G.

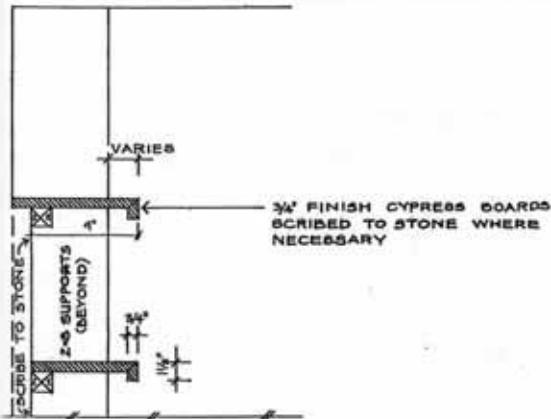
- A. HAGAN HOUSE, 1954
- B. ZIMMERMAN HOUSE, 1950
- C. MOSSBERG HOUSE, 1948
- D. FALLINGWATER, 1934
- E. HAGAN HOUSE, 1954
- F. TALIESIN WEST, 1937
- G. NEILS HOUSE, 1949
- H. HANNA HOUSE . 1936
- J. FC BOGK HOUSE, 1916



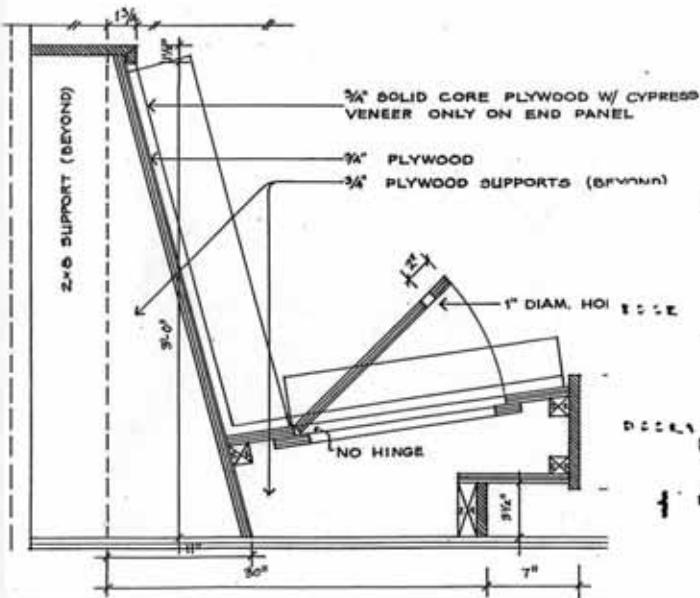
H.



J.

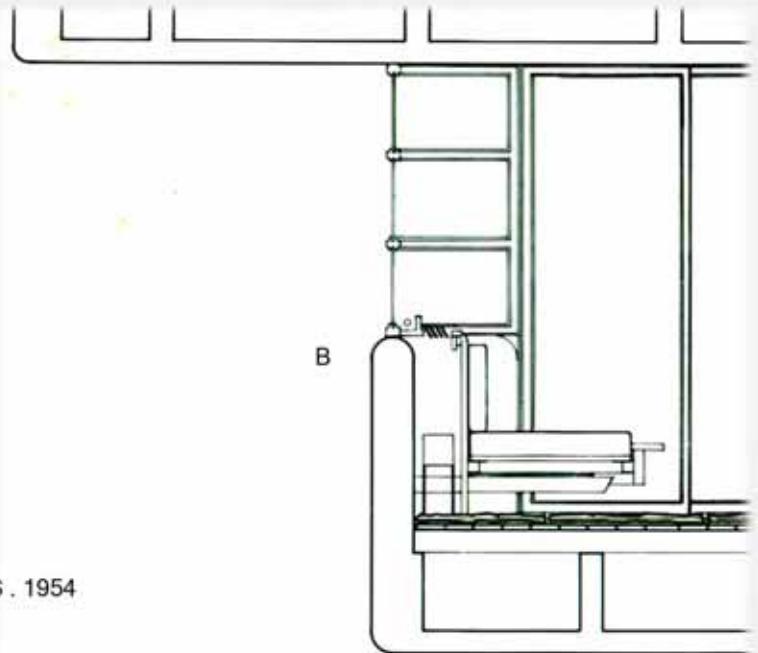


TYPICAL BOOKSHELVES

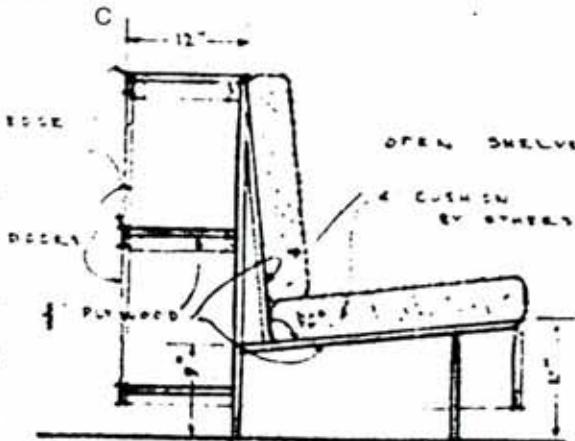


A

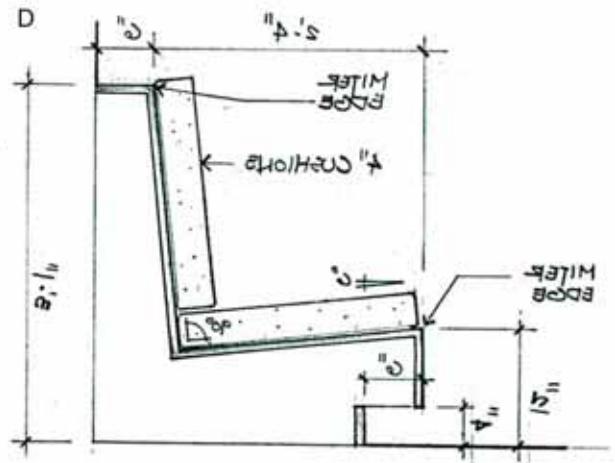
- A: KENTUCK KNOB
- B: FALLINGWATER . 1936
- C: KRAUS HOUSE . 1951
- D: POINT VIEW APARTMENTS . 1954



B

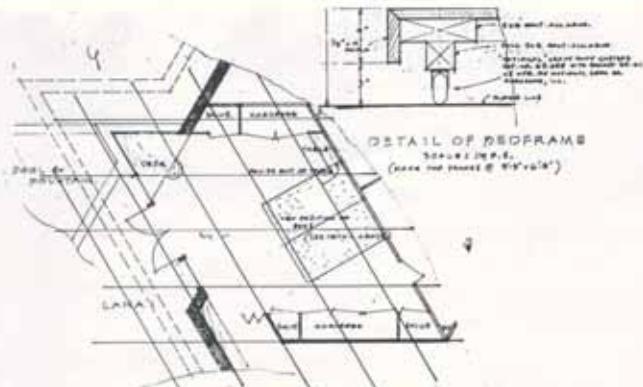


C



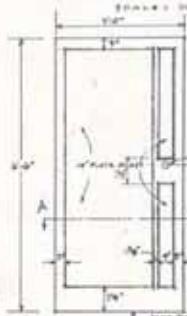
D





DETAIL OF BED FRAME  
SCALE: 1/8" = 1'-0"

PLAN OF MASTER BEDROOM  
SCALE: 1/4" = 1'-0"

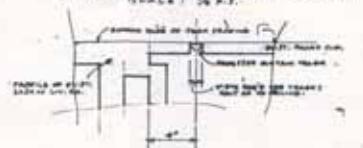


ELEVATION  
DOOR EXTERIOR - 1/4" = 1'-0"

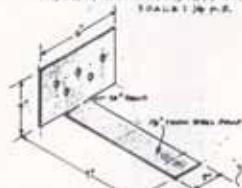
NOTES: IN DOOR:  
- DOOR TO BE MADE OF ONE PIECE, AS SHOWN, EXCEPT IN THE CASE OF SPECIAL ORDER.  
- MAKE A CORNER REINFORCEMENT TO BE MADE OF 1/2" THICK  
- TO BE USED AT CORNER JOINTS (SEE NOTE ON OTHER DRAWINGS)  
- VERIFY ALL CORNER JOINTS ON JOB AND CHANGE TO BEST JOB  
- CONDITIONS WERE OBSERVED.  
- REFER TO ARCHITECT'S OFFICE.

DETAILS OF NEW ENTRY DOOR  
SCALE AS NOTED

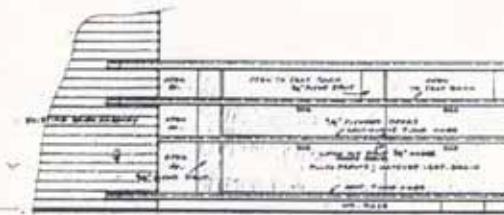
DRAPERY LEIGE IN B. DORM.  
SCALE: 1/8" = 1'-0"



DRAPERY TRACK IN LIVING RM.  
SCALE: 1/8" = 1'-0"

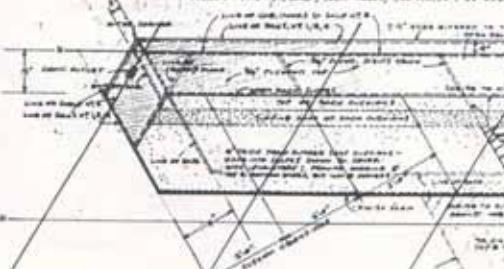


ISOMETRIC DETAIL OF BRACKET TO  
SUPPORT DRAPERY LEIGE  
SCALE

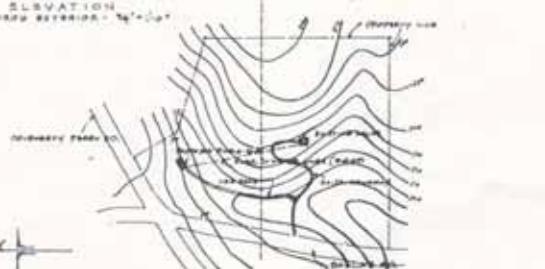


ELEVATION OF SIDE FACING WALL  
SCALE: 1/4" = 1'-0"

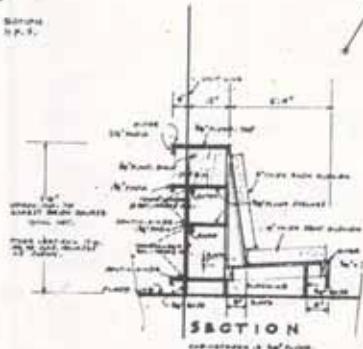
NOTES: THE FINISHES:  
- FINISH: BRICK, BRICKS WITH GROUT, FLOOR WITH 1/2" GROUT  
- INTERIOR USE: STAINLESS STEEL OR ALUMINUM TRAY  
- FLOOR: WHITE 1/2" GROUT, BRICK WALLS, USE BRICKS AS ABOVE



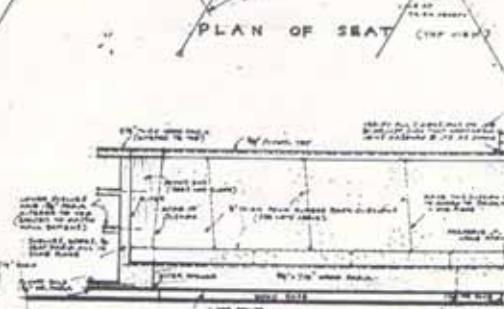
PLAN OF SEAT (TOP VIEW)  
SCALE: 1/4" = 1'-0"



PLOT PLAN OF KRAUS PROPERTY  
SCALE: 1/4" = 1'-0"



SECTION  
SCALE: 1/4" = 1'-0"



ELEVATION OF FRONT  
DETAILS OF LIVING ROOM SEAT  
SCALE: 1/4" = 1'-0"

NOTES: THIS DRAWING IS IN ACCORD WITH CHAPTER 17, SECTION 1701 OF THE PENNSYLVANIA BUILDING CODE, 1968 EDITION, AND THE PENNSYLVANIA MECHANICAL AND PLUMBING CODE, 1968 EDITION, AND THE PENNSYLVANIA ELECTRICAL CODE, 1968 EDITION.

HOUSE FOR MR. & MRS. RUSSELL KRAUS

# Furniture from other designers: George Nakashima

The furniture in context

NAKASHIMA WORKSHOP



Example of coffee table. Characteristic of coffee table design, low to the ground, maintaining natural shape of tree, allowing grain to remain visible.

Slab Coffee Table, 1947



Brogren Stool, 1946



Cantilevered chair

Conoid Chair, 1968



## EXAMPLES OF WORK SIMILAR TO THAT IN THE HAGAN HOUSE



Example of a chair and a stool with a woven grass seat. Use of multiple materials, all natural.

Grass-seated Chair and Grass-seated Stool, 1944  
27 1/4 x 23 1/2 x 19 1/2 inches (chair)  
12 1/2 x 18 x 16 inches (stool)  
cherry, maple, and sea grass



Chest, used for storage and to divide space  
Conoid Room Divider, 1970



KENTUCK KNOB  
HALLWAY WITH  
BENCH



The Conoid Cushion Chair, 1961

## Furniture from other designers: Finn Juhl

### The furniture in context



Two seater and armchair in the living room



Armchair

### Examples of work similar to that in the Hagan House



Thin structural elements  
Parts that come into direct contact with the body soft and curved  
Two materials, one used for support, one for comfort

Chieftain Chair, 1949  
Rosewood and leather



Armchair, 1945

### Furniture by Frank Lloyd Wright



Chairs from the Henry Neils house, 1949



From the Robert Llewellyn Wright house in Bethesda Maryland, 1956



Sofa, 1948

The furniture in context



LEATHER CHAIR



"THE CHAIR"



The Round Chair, 1949  
oak

Example of a chair with Wegner's signature style of having only the basic elements of a chair: legs, seat, and the top rail that turns into the arm rest.



The Chinese Chair, 1944



The Valet Chair, 1953



Shell Chair, 1949



The Ox-chair, 1960

Example of a black leather chair by Wegner. Similar in design to the one in the Hagan House except for the "ox" horns.





TOP L-R: AULDBRASS, 1938; TALIESIN WEST, 1937; ZIMMERMAN HOUSE, 1950

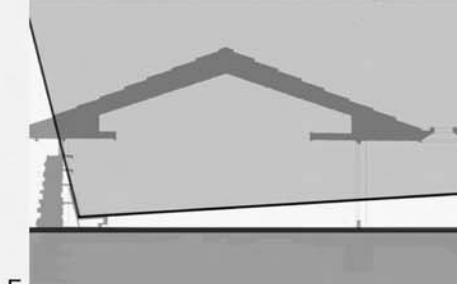
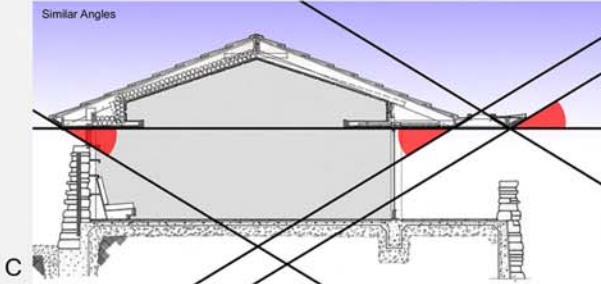
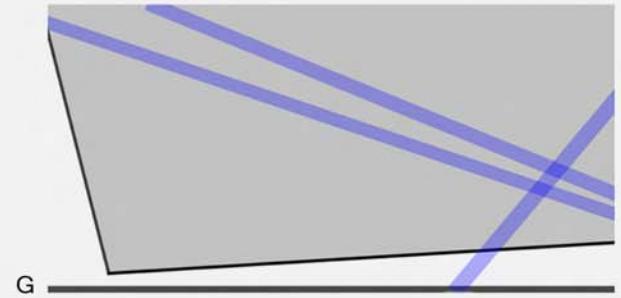
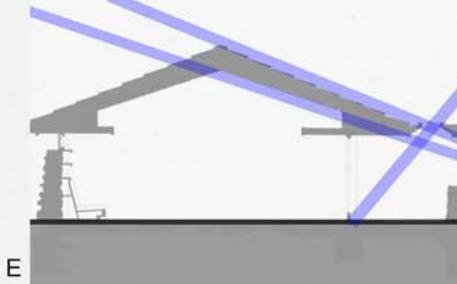
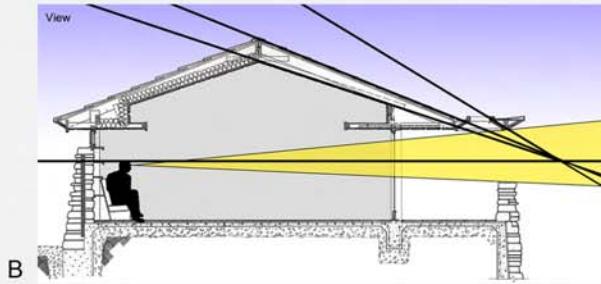
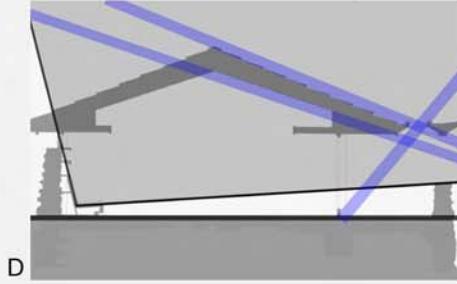
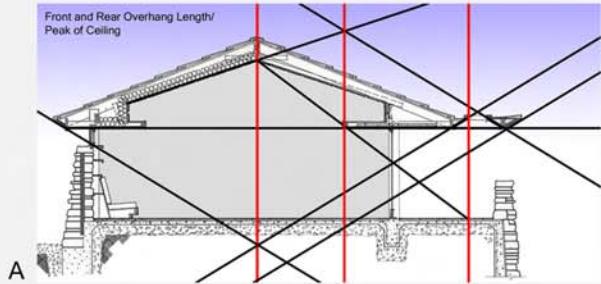
MIDDLE ROW: JOHNSON HOUSE, 19xx

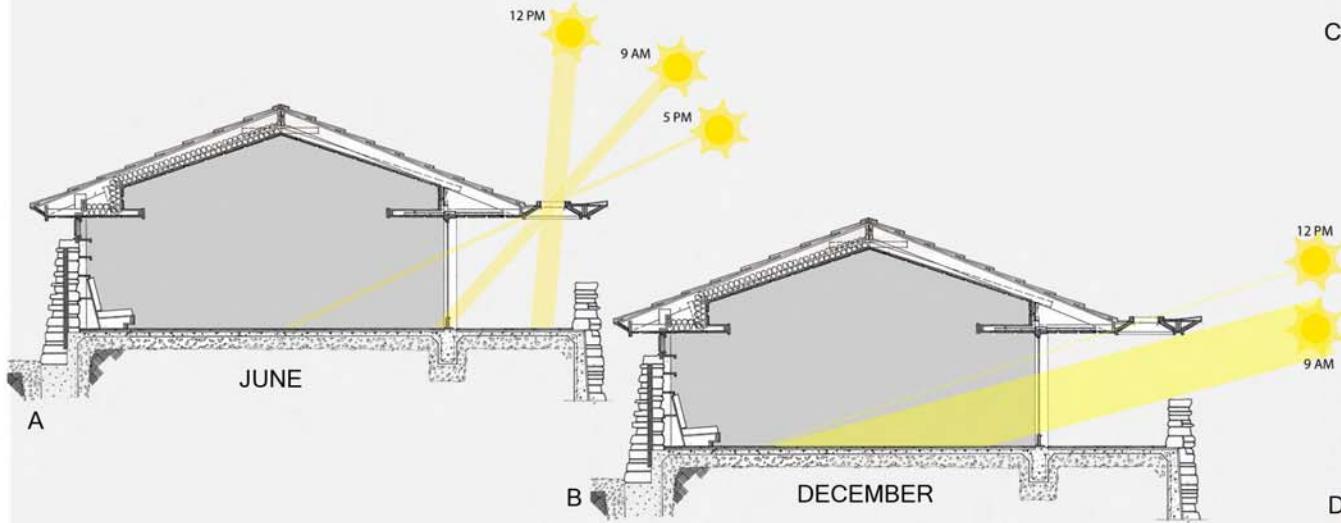
BOTTOM L-R: RAYWARD HOUSE, 1955; TALIESIN, 1925



# EXTERIOR

:: OVERHANG AND TRELLIS

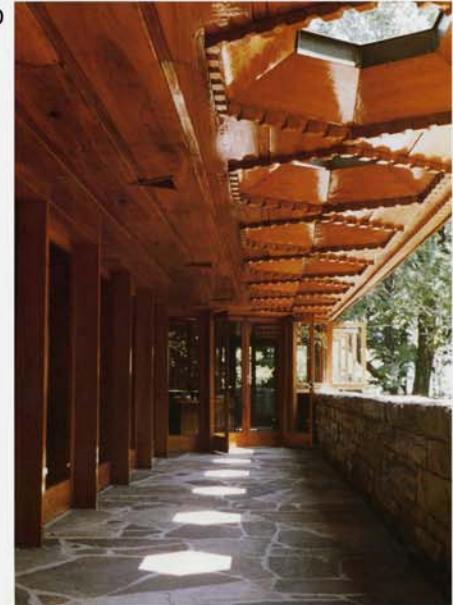




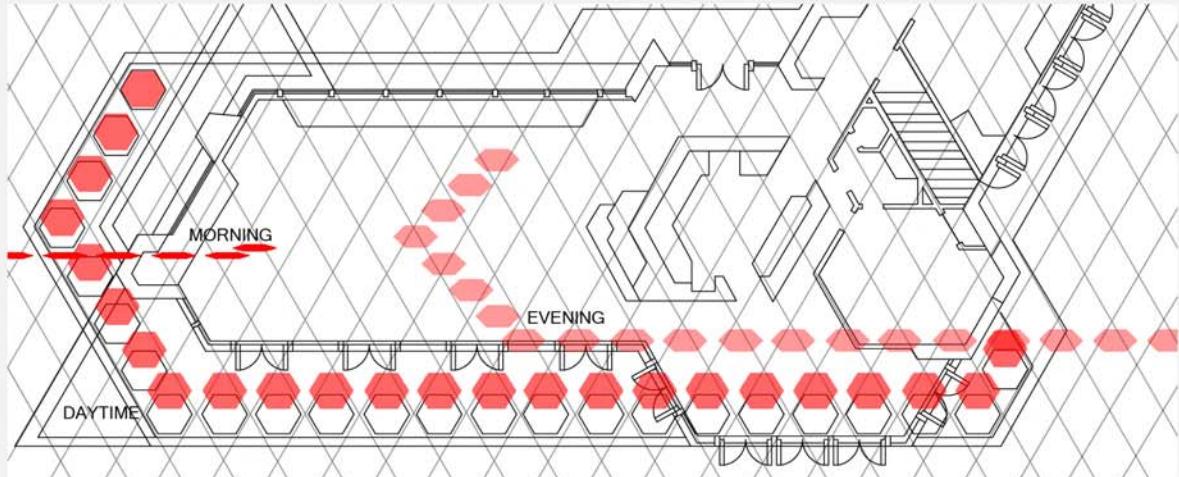
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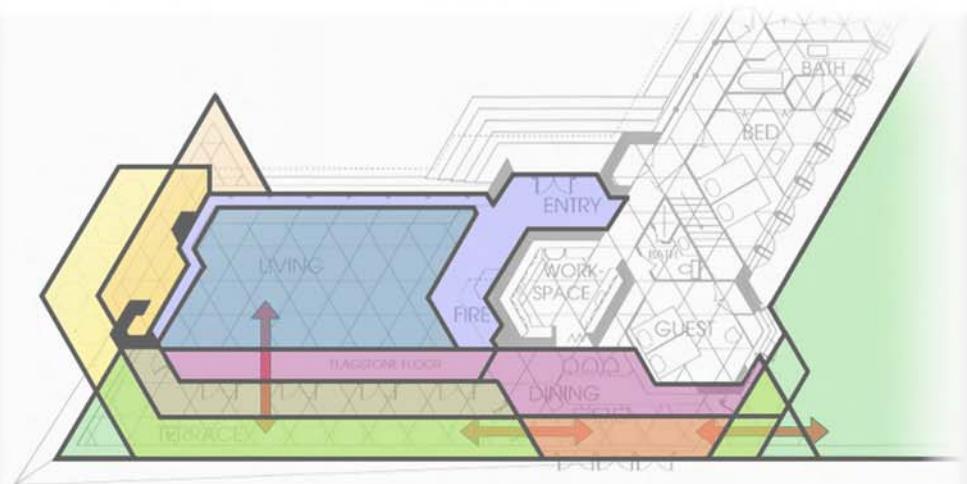
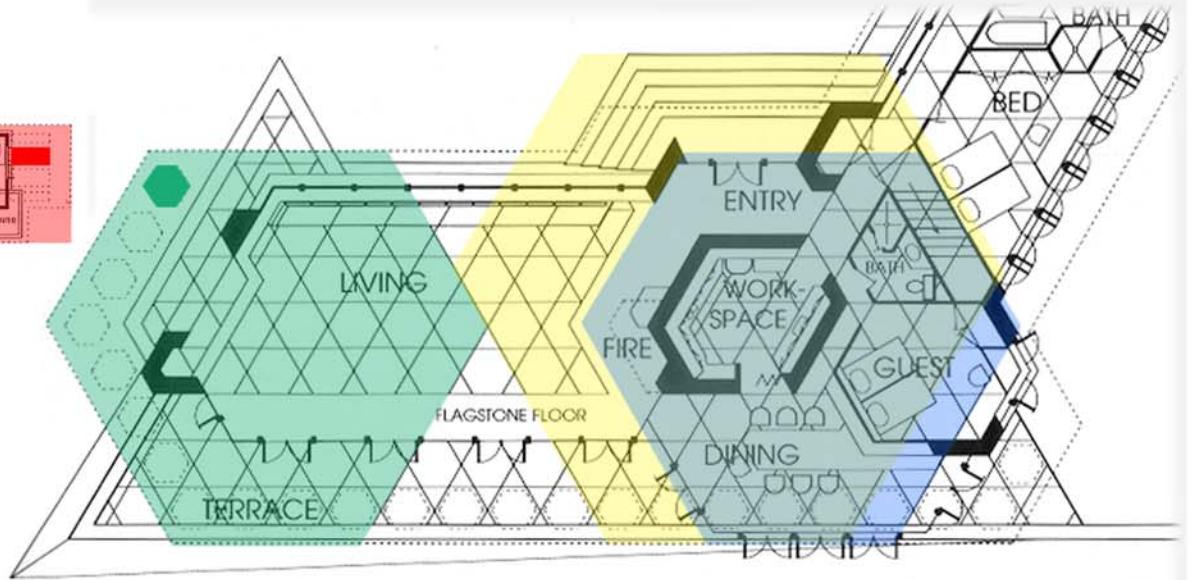
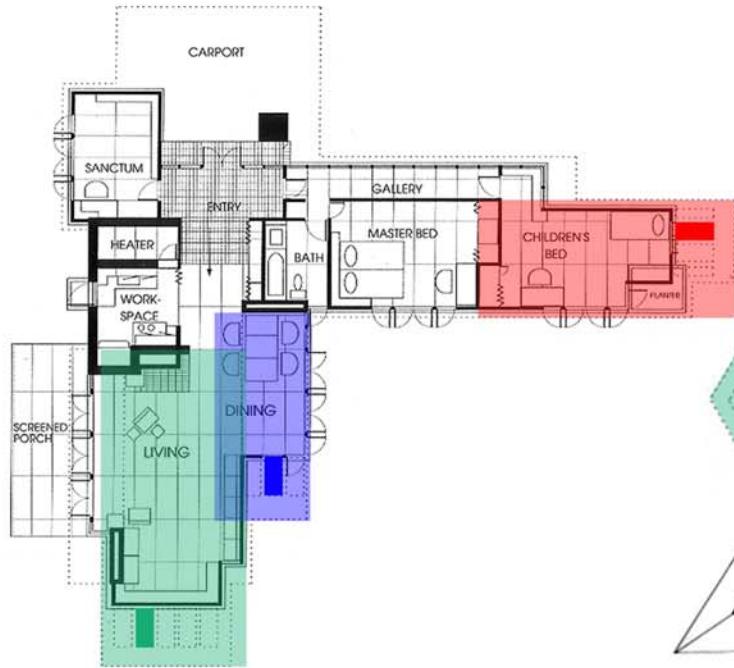


D



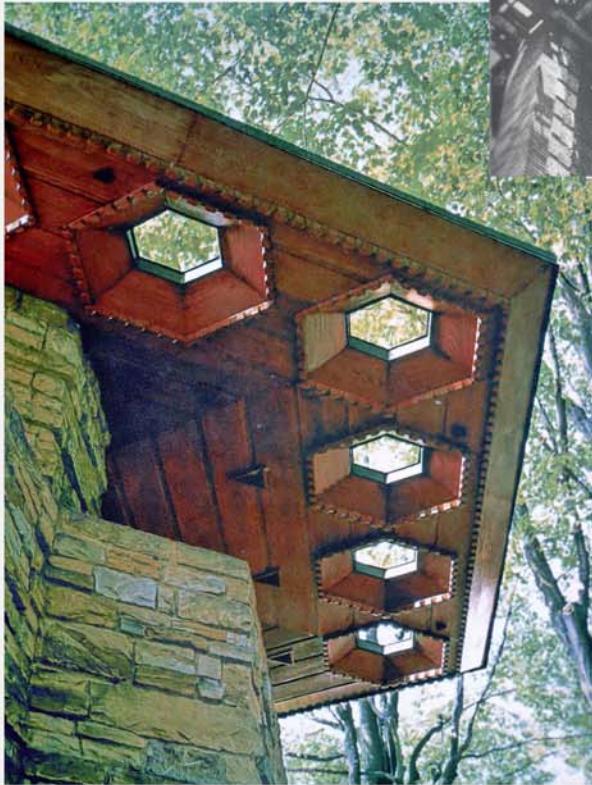
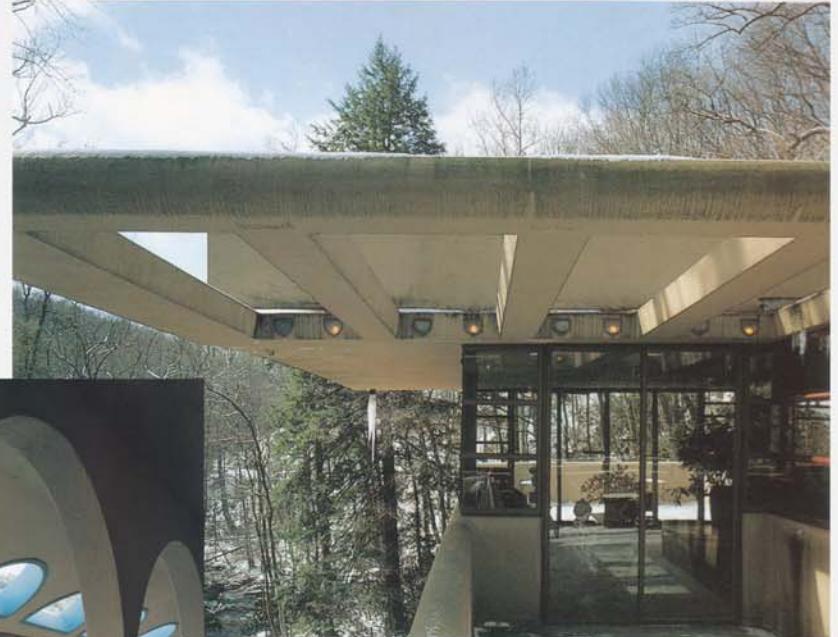
E

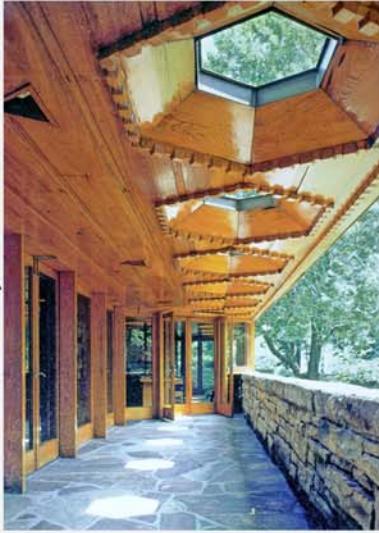




TOP L-R:  
IMPERIAL HOTEL, TOKYO . 1915  
FALLINGWATER . 1934

BOTTOM L-R:  
KENTUCK KNOB  
MARIN COUNTY CIVIC CENTER . 1957  
WALTER HOUSE . 1945





A



B



C



D



E



F



G



H



J



K

- A: KENTUCK KNOB
- B: WALTER RESIDENCE . 1945
- C: M.M. SMITH . 1946
- D: BUEHLER . 1948
- E: TALIESIN WEST . 1937
- F: UNKNOWN
- G: RICHARD SMITH HOUSE . 1950
- H: POPE-LEIGHEY . 1939
- J: STURGES HOUSE . 1939
- K: MATHEWS HOUSE . 1950



**ARCHITECT: MARCEL BREUER**

This house was built in 1946-47 in Ligonier, Pennsylvania. The owner lives in the house only in the summer and spends the winter, for health reasons, in Arizona. Her main interest is social and community activities, her children being married and living separately. The house is designed very much for her personal needs and living, but it could be just as well used for one of the married sons and grandchildren, or, alternatively, as a club or community recreation house.

Before the house was built the owner had a log

**HOUSE IN PENNSYLVANIA**



**A**



**B**

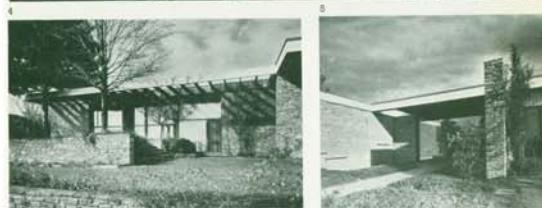


**MARCEL BREUER**

**A: THOMPSON HOUSE . 1946**

**B: GANE'S PAVILION . 1936**

**C: BREUER HOUSE 2 . 1947**



**C**



A



B

MODERNISTS

- A: HARKAVY RESIDENCE .  
1957 - UNKNOWN
- B: UMBRELLA HOUSE .  
1953 - PAUL RUDOLPH
- C: BAILEY HOUSE .  
1947 - NEUTRA
- D: CASE STUDY HOUSE 22 .  
1958 - KOENIG
- E: CASE STUDY HOUSE 20 .  
1947 - NEUTRA



C

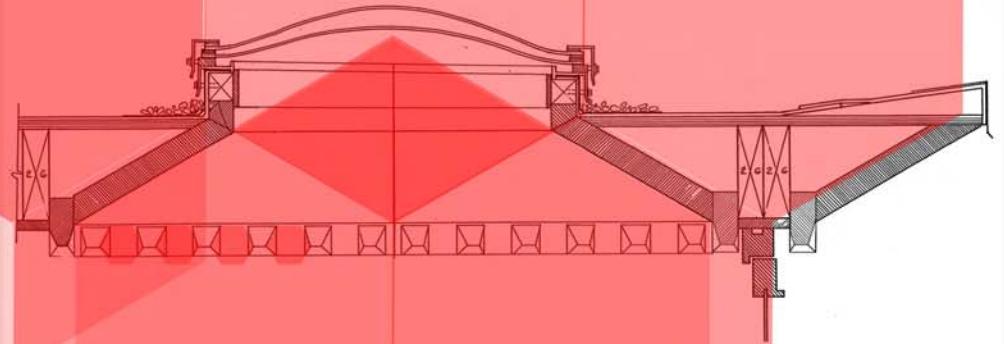
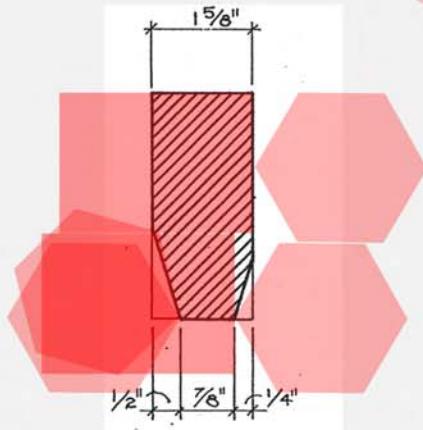
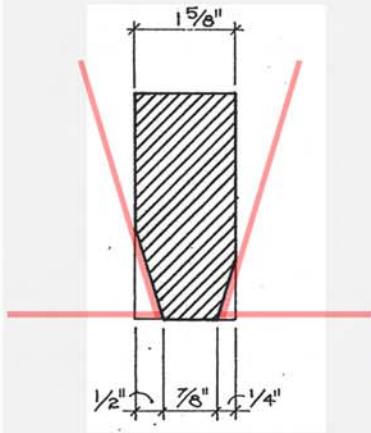


D



E







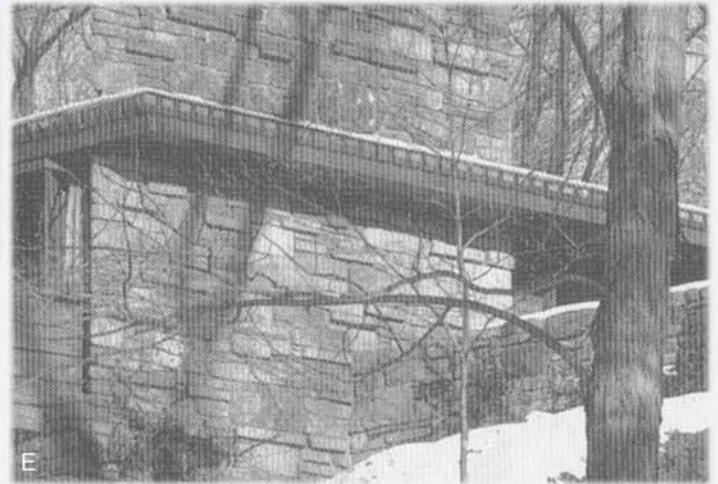
A



D



B



E



C

- A: FAWCETT HOUSE . 1955
- B: FALLINGWATER . 1936
- C: FLW OAK PARK HOUSE . 1889
- D: MATHEWS HOUSE . 1950
- E: REISLEY HOUSE . 1951